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Machine for Beveling Carte de Visite Frames.

This machine is designed to accomplish a task heretofore done by hand—that is, bevel the edge of the pasteboard frame used in photograph albums. The frame is that part which receives the picture, but the reader need not look for the beveled edge as it is covered by an ornamental border. The object of beveling the edge is to allow the picture to be slipped in and taken out readily. The frame is so thick that, were it not for this precaution, the picture could not be inserted or removed.

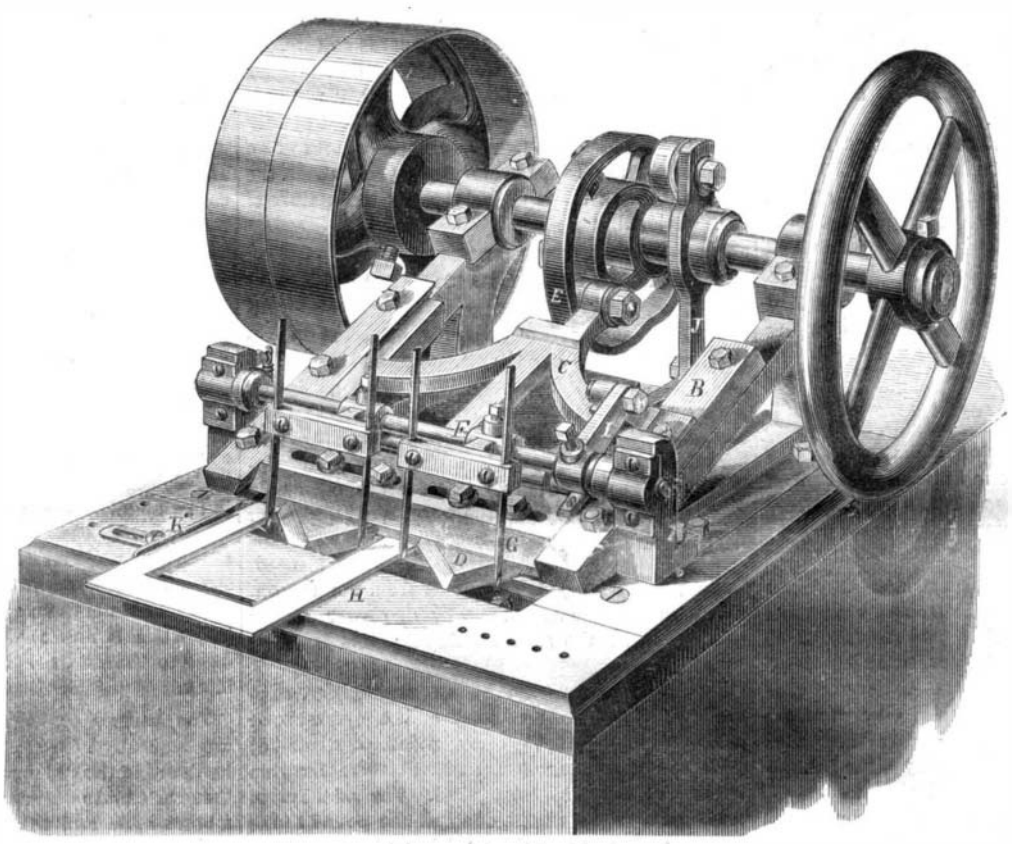
The parts of the machine are necessarily compact in order to bring it within a small compass, but it is not complicated, although it has that appearance at the first glance.

In detail it consists of a frame, A, having guides, B, which carry a slide, C. This slide is fitted with knives, D, and is worked up and down the guides by the cam, E.

In addition to this there is a transverse shaft, F, having vertical cutters, G.

The knives, D, cut or shave the bevel on the frame by placing it on the platen, as shown at H, and giving motion to the slide, C, through the pulleys. As the knives descend, the points enter first and pass through, the corners having to be cut afterward by the vertical cutters, G. The latter are operated by a dog on the slide, C, and the arm, I, on the transverse shaft. The action of these cutters is very quick, they working and withdrawing while the knives are moving down to make the bevel. The arm, J, acts on a compresser below the frame and not in sight. This detail holds the inner end of the card so that it cannot slip while being cut; a gage, K, at the side serves also to guide the card evenly. This machine is now in use in this city and is doing good service. It does the business with more efficiency and greater rapidity than several men, and can be attended by boys.

Patented through the Scientific American Patent Agency on Sept. 19, 1865. For further information address the patentee, C. T. Bedell, No. 45 Center street, New York.



BEDELL'S MACHINE FOR BEVELING CARTE DE VISITE FRAMES.

New Substance for Soling Shoes.

The *Shoe and Leather Reporter* thus notices a new material for soling shoes which seems to be the climax of improvement in this department. It appears to be a substance of which india-rubber is the basis, but it is heavier, and has a solidity almost of iron, yet a flexibility and elasticity which render it a most perfect substance for the purpose for which it is specially offered. It is not at all of the vulcanized rubber character, though it appears at a glance like that material. As an article for soles it will undoubtedly outwear four pair of the best English leather. This substance is not to take the place of the ordinary leather sole, but it is to be applied by a peculiar cement to the boot or shoe, to which it appears to adhere perfectly. It is then pared on the edge, and the work is over. Heels are put on in the same way. The inventor says a pair of soles, worn daily, will last one year. It is patented and will soon be introduced. It has one rare and valuable disideratum. Any one possessing an ordinary shoe knife, a sandstone to sharpen it, a box of the cement, and a few pounds of this substance, can set up a shoe shop; and the regular shoe trade can make it a most profitable branch of industry.

A Tight Ship.

The *Achilles* is an iron armored vessel of 6,079 tuns, and 380 feet long. She has been afloat ten months, and during that time, I am informed on reliable authority, not as much as a wine glass of water has leaked into her; this is a circumstance unparalleled in the history of ship building, and, unless she should be run on a hard bottom there is no reason why she should not remain tight for many years. The perfection of construction is to be attributed to the following facts; that all the frames were accurately shaped, that every sheet in the whole formation was planed on the edges and accurately punched to gages, so that all holes required to correspond met mathematically correct, every rivet was put in with care and afterward inspected, and all the metal was of the best refined iron; no ordinary ship plates were used.

Such perfection in materials and workmanship is only to be obtained through good mechanical judgment and perseverance and patience on the part of inspectors. The *Achilles* was the first vessel built by the Admiralty in dry dock, and I am particular in mentioning the case because the value of the experience is of the utmost importance in iron ship building. The strength and endurance of iron ships over wooden ones is acknowledged—it only remained to be proved that they could, of any dimensions, be built perfect; the *Achilles* is the proof.—*King's Report on the Dock Yards of England.*

Pohtographic Manipnlation.

INTENSIFYING VARNISHED NEGATIVES.—A good negative, in its unvarnished state, sometimes becomes so weakened upon varnishing as to be almost worthless. As a remedy several methods have been proposed for increasing the intensity of a varnished negative under such circumstances. The following is one of the best:—The film is first to be moistened with alcohol, to *slightly* soften the varnish; this is followed by pouring over the plate an alcoholic solution of iodide, containing one or two grains to the ounce, watching the effect carefully. As soon as the color of the image is changed to a non-actinic *olive tint*, the plate must be again *quickly* washed with alcohol, and finally with water and dried. It may then be re-varnished if required.

INTENSIFYING REPRODUCTIONS.—In intensifying copies of prints or engravings requiring deep black and pure white, what is called the "clearing-up process," may be resorted to for preventing the clogging-up of fine lines or fogging during the progress of intensification. This consists in flooding the iron negative with a solution of iodine in iodide of potassium, about one grain of the former to two grains of the latter in one ounce of water; the effect of this is to convert any slight deposit of silver on the shadows into an iodide, which is then to be removed by pouring over the plate a *very dilute solution* of cyanide of potassium. After copious washing, the negative is then to be intensified as usual, when the utmost density may be obtained without any deposit upon the shadows, which remain perfectly clear.

ENLARGING AND COPYING—There are several ways of copying. The most simple method of taking an enlarged copy of a positive print is by an elongation of the camera; the exact distance to bring it into focus of the required size being easily ascertained by a little adjustment of the camera. Positive pictures, however, taken from negative plates obtained by this method, are not very satisfactory if the enlargement has been carried to any extent, as the *texture of the paper* of the positive copied is *also enlarged* in the same ratio as the image, which produces in the reproduction a coarse and woolly effect. It is obvious, therefore, that whenever the *original negative* can be obtained, an enlargement from *it* taken by transmitted light will give much better results. In this way enlargements from stereotype size, up to ten by eight, answers exceedingly well. Proceed as follows:—Procure a stout base board about thirty inches

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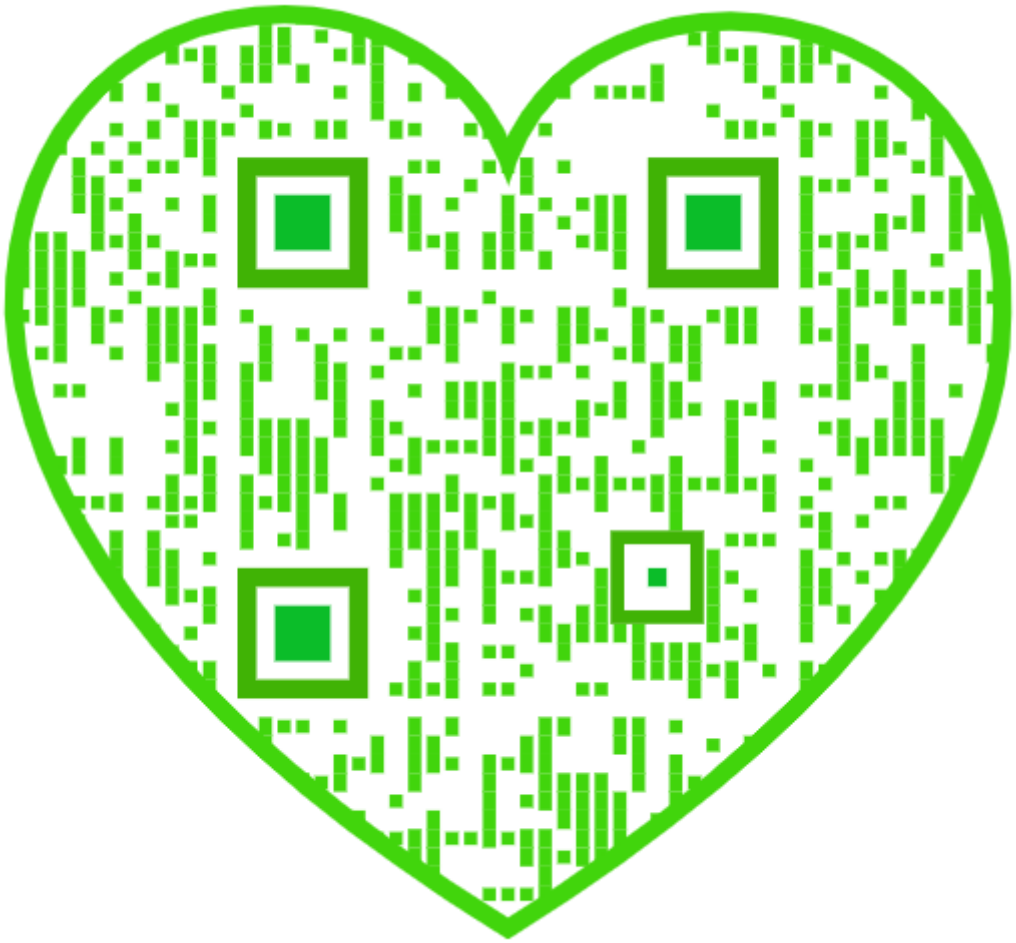

long and twelve wide; to the sides or top of this affix slips of wood, raised about an inch or so above the level of the board throughout its entire length, within which the camera is made to slide. At the *lens* end of the latter is affixed a dark box of sufficient length and diameter, within which is made to slide an *inner* box about three or four inches long, with a groove at one end to receive the plateholder, which should be provided with frames to receive the plates of the required size. By this simple arrangement we are enabled to adjust the focus without much difficulty, and by sliding the negative plate nearer to, or further from, the lens, we get either an enlarged or diminished positive copy, as may be required. When required for use, a negative plate is placed in the holder, and the camera so placed that a *bright light* from the north or toward the zenith, is made to pass *through* the negative to the lens in the camera attached, by which is found an image on the ground glass. By a little care in focussing, we are now able to get a perfectly-defined image of the negative, when having introduced a stop with an aperature sufficiently small to produce the sharpest image to be obtained with sufficient illumination, the ground glass is replaced by the sensitised plate, which is exposed and developed in the usual manner. The image so obtained is a transparent *positive*. We now *repeat* the process, removing the original negative from the frame, which is replaced by the *transparent positive*, from which we obtain a printing negative of the required size. Negatives from which enlargements are required should be sharp and well defined, and as free from blemishes of all kinds as possible, as any defect in the original will, of course, become more apparent in the enlarged copy. The negative for enlarging is best if *unvarnished;* it should be soft and full of detail, as almost any amount of density may be produced in the copy by careful manipulation in the development and intensification. Transmitted positives may also be taken in direct sunlight, but in that case it must be *diffused* by first passing *through ground glass.* NOTE.—When copying paintings or engravings, it is best to focus with the *full* aperature of the lens that part of the picture which is about *one-fourth* of its diameter from the outer edge; a stop of the requisite size is then inserted, when the copy will be equally defined in all its parts.

HINTS ON LANDSCAPE PHOTOGRAPHY.—The best effects of light in a landscape are secured when white or light grey clouds are driving past the sun; these always give much reflected light, throwing detail and transparency into the deepest shadows. Brilliant effects may often be secured, when taking a view, by a *momentary* exposure during direct sunlight, without destroying the harmony of the picture. The principal object to be focussed should never be exactly in the *middle* of the picture, but more or less on one side. In the case of streets or avenues, these should pass up the picture obliquely; never in straight lines. The horizon should never cut the picture into two equal parts; in a level view, about one-third the hight of the picture may be allowed, and two-thirds when mountains and hills are in the background. As a rule it is best to keep the camera about as high as the head of the operator, especially when *water* is introduced in the view; for unless the lens is kept high enough to look *into it*, the reflection of surrounding objects will be lost.

HINTS ON PORTRAITURE.—When taking portraits care should be taken to cut off from the lens all light from extraneous objects. The best aspect for an operating room for portraiture is one facing the north or northeast. At one end the top and one side should be of glass; a little beyond this the sitter should be placed so that the vertical light is made to fall on an angle of about forty-five degrees; the face of the sitter should be turned toward the darkest side of the room. A screen covered with white paper or calico will be found useful, by shifting which as required the *depth* of the shadow on the side turned from the direct light may be regulated. The lens should be made to work with a moderately large aperature, if we obtain clear definition, by which greater relief and vigor is secured. The sitter should be so placed that all parts of the body are as nearly equi-distant from the lens as possible, as those parts nearest the lens always suffer a certain degree of enlargement and distortion. In portraiture it is almost necessary that we should work with a rapid lens to secure good impressions; and with a lens of moderately short focus we may expect to obtain more brilliancy from a less extent of hazy atmosphere, often interposed between it and the sitter. In regard to the best hight of the camera from the floor, it is recommended as a rule to bring the lens about opposite to the *chest of the model.* For giving perfect equality of definition this is somewhat too high; but on the other hand, if the lens were placed lower, the face would be rendered as if the observer were *looking up* at it; and a somewhat unnatural and unartistic view of the features obtained. When a plain background is used, it should be darker than the *lightest* shadows and lighter than the *darkest. Striking* accessories should be generally avoided, as they tend to distract attention from the principal figure and face, in which the chief interest should be concentrated.

DRESS.—For ladies, silks and satins of various shades, as reflecting much light, are to be preferred; dark woolen fabrics avoided. Open white lace upon a dark ground has a good effect, but *plain* white or light muslins should be avoided. When taking album portraits we should observe a *fixed* distance between the camera and the sitter, in all cases so arranged as to give a certain definite scale to the pictures, suggestive of truth as regards stature. If four-tenths of an inch is allowed in the picture for every *foot* in hight of a standing figure, it will be a good proportion; and if we cut the finished picture so as to leave about a fourth or three-eighths of an inch below the feet, the varying space above the head will give a tolerably just idea of the stature of the individual.

HARDENING SAWS AND OTHER ARTICLES.

Saws and springs are generally hardened in various compositions of oil, suet, wax and other ingredients, which, however, lose their hardening property after a few weeks' constant use: the saws are heated in long furnaces, and then immersed horizontally and edgeways in a long trough containing the composition; two troughs are commonly used, the one until it gets too warm, then the other for a period, and so on alternately. Part of the composition is wiped off the saws with a piece of leather, when they are removed from the trough, and then they are heated one by one over a clear coke fire, until the grease inflames; this is called "blazing off."

The composition used by an experienced sawmaker is two pounds of suet and a quarter of a pound of bees-wax to every gallon of whale-oil; these are boiled together, and will serve for thin works and most kinds of steel. The addition of black resin, to the extent of about one pound to the gallon, makes it serve for thicker pieces and for those it refused to harden before; but the resin should be added with judgment, or the works will become too hard and brittle. The composition is useless when it has been constantly employed for about a month; the period depends, however, on the extent to which it is used, and the trough should be thoroughly cleaned out before new mixture is placed in it.

The following recipe is recommended; twenty gallons of spermaceti oil; twenty pounds of beef suet is rendered; one gallon of neat's-foot oil; one pound of pitch; three pounds of black resin.

These last two articles must be previously melted together, and then added to the other ingredients; when the whole must be heated in a proper iron vessel, with a close cover fitted to it, until the moisture is entirely evaporated, and the composition will take fire on a flaming body being presented to its surface, but which must be instantly extinguished again by putting on the cover of the vessel.

When the saws are wanted to be rather hard, but little of the grease is burned off; when a milder, a larger portion; and for a spring temper, the whole is allowed to burn away. When the work is thick, or irregularly thick and thin, as in some springs, a second and a third dose is burned off, to insure equality of temper at all parts alike.

Gun-lock springs are sometimes literally fried in oil for a considerable time over a fire in an iron tray; the thick parts are then sure to be sufficiently reduced, and the thin parts do not become the more softened from the continuance of the blazing heat.

Springs and saws appear to lose their elasticity, after hardening and tempering, from the reduction and friction they undergo in grinding and polishing. Toward the conclusion of the manufacture, the elasticity of the saw is restored principally by hammering, and partly by heating it over a clear coke fire to a straw color: the tint is removed by very diluted muriatic acid, after which the saws are well washed in plain water and dried.

Watch springs are hammered out of round steel wire, of suitable diameter, until they fill the gage for width, which at the same time insures equality of thickness; the holes are punched in their extremities, and they are trimmed on the edge with a smooth file; the springs are then tied up with the binding-wire, in a loose open coil, and heated over a charcoal fire upon a perforated revolving plate; they are hardened in oil, and blazed off.

The spring is now distended in a long metal frame, similar to that used for a saw blade, and ground and polished with emery and oil, between lead blocks; by this time its elasticity appears quite lost, and may be bent in any direction; its elasticity is, however, entirely restored by a subsequent hammering on a very bright anvil, which "puts the nature into the spring."

The coloring is done over a flat plate of iron, or hood, under which a little spirit-lamp is kept burning; the spring is continually drawn backward and forward, about two or three inches at a time, until it assumes the orange or deep blue tint throughout, according to the taste of the purchaser; by many the coloring is considered to be a matter of ornament, and not essential. The first process is to coil the spring into the spiral form, that it may enter the barrel in which it is to be contained; this is done by a tool with a small axis and winch handle, and does not require heat.

The balance-springs of marine chronometers, which are in the form of a screw, are wound into the square thread of a screw of the appropriate diameter and coarseness; the two ends of the spring are retained by side-screws, and the whole is carefully enveloped in platinum-foil, and tightly bound with wire. The mass is next heated in a piece of gun barrel closed at the one end, and plunged into oil, which hardens the spring almost without discoloring it, owing to the exclusion of the air by the close platinum covering, which is now removed, and the spring is let down to the blue, before removal from the screwed block.

The balance or hair-springs of common watches are frequently left soft; those of the best watches are hardened in the coil upon a plain cylinder, and are then curled into the spiral form between the edge of a blunt knife and the thumb, the same as in curling up a narrow ribbon of paper, or the filaments of an ostrich feather.

In hardening them they are heated by being drawn backward and forward through an ordinary forge fire, built hollow, and they are immersed in a trough of plain water; in tempering them they are heated until the black red is just visible at night; by daylight the heat is denoted by its making a piece of wood sparkle when rubbed on the spring, which is then allowed to cool in the air. The metal is nine-sixteenths of an inch thick, and some consider five-eighths the limits to which steel will harden properly, that is sufficiently alike to serve as a spring; their elasticity is tested far beyond their intended range.

Great diversity of opinion exists respecting the causes of elasticity in springs; by some it is referred to different states of electricity; by others the elasticity is considered to reside in the thin blue, oxidized surface, the removal of which is thought to destroy the elasticity, much in the same manner that the elasticity of a cane is greatly lost by stripping off its silicious rind. The elasticity of a thick spring is certainly much impaired by grinding off a small quantity of its exterior metal, which is harder than the inner portion; and perhaps thin springs sustain in the polishing a proportional loss, which is to them equally fatal.

It has been stated that the bare removal of the blue tint from a pendulum spring, by its immersion in weak acid, caused the chronometer to lose nearly one minute each hour; a second and equal immer-

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sion scarcely caused any further loss. It is supposed springs get stronger, in a minute degree, during the first two or three years they are in use, from some atmospheric change; when the springs are coated with gold by the electrotype process, no such change is observable, and the covering, although perfect, may be so thin as not to compensate for the loss of the blue oxidized surface.—*Metal-Worker's Assistant.*

DR. VŒLCKER ON DISINFECTANTS.

Dr. Vœlcker recently delivered a practical lecture to the members of the Royal Agricultural Society on the subject of disinfectants, of which we reprint a portion.

The professor stated that microscopic researches have proved that the contagious matter of cattle plague consists of minute and peculiar organic cells moving about rapidly, that these cells were found in the dung of diseased animals, and, it was believed, might be given off by lungs and skin, and thus, either from the droppings, or floating about in the atmosphere, and capable of being wafted some distance, were introduced into the blood of animals brought within range of their baneful influence. He divided the subject under three heads—viz.: 1. Various disinfectants recommended, their mode of action, and efficiency. 2. Application of same for particular purposes. 3. Means of prevention. He first explained the nature of a true disinfectant, and how incorrectly the term was often applied to agents that acted in a totally different manner. The term disinfectant should only be applied to those matters that can actually destroy the contagious matter, whereas it was often applied to substances which neutralize or destroy gaseous products of decomposition; thus, sulphate of iron removes sulphureted hydrogen from the air without destroying the animal matters, which, on decomposition, evolve this gas; whereas chlorine and nitrous acid completely break up or destroy decomposing matters, converting them into their ultimate gaseous products, which are comparatively harmless. The latter are true disinfectants, as well as deodorizers. Again, substances which retard or prevent putrefaction are antiseptics; thus, weak solutions of carbolic acid do not destroy, but arrest putrefaction.

As true disinfectants we may class chloride of lime, chlorine gas, sulphurous acid, nitrous and nitric acid, charcoal, quicklime, caustic alkalies, earth, manganates and permanganates, and the action of fire.

Chloride of lime, which is, perhaps, the most useful of the above, acts by yielding up oxygen, which destroys organic matters; 1 pound of chloride of lime to 3 gallons of water forms a proper solution for applying to droppings of cattle, washing down floors, walls, etc.; while 2 ounces of the same, with 1 gallon of water, is a suitable mixture for washing our hands, or sprinkling on the clothes of those engaged in attending on diseased animals.

Chlorine gas and sulphurous acid fumes are useful for disinfecting buildings. The latter is the easiest to apply, as the combustion of ½ pound of flour of sulphur, in three or four little heaps on the floor, will produce abundance of sulphurous acid.

Nitric acid for the same purpose, obtained by mixing 4 ounces powdered niter, 4 ounces oil of vitriol, and 2 ounces water in an earthen vessel, and heating over a brazier.

Nitrous acid is made by pouring ½ pound of oil of vitriol on 2 or 3 ounces of copper shavings. All these produce disinfecting fumes.

Wood and peat charcoal are powerful disinfectants, as the condensed oxygen in the cells hastens decomposition and eats up organic matter, fresh supplies of oxygen being absorbed from the atmosphere and condensed; and thus the process continues. A small quantity of peat charcoal will destroy a large quantity of animal matter. This substance is very good to cover carcasses that are buried.

Porous earth acts as a true disinfectant.

Caustic soda and soda ash: the latter is better than lime, as it dissolves in water, readily enters porous materials, and removes impurities from the surface.

Condy's Fluid, a solution of manganate and permanganate of potash, is a good disinfectant, freely supplying oxygen; but it is not practically available by farmers. Fire and high-pressure steam destroy infectious poisons.

As simple deodorizers Dr. Vœlcker merely mentions perchloride of iron, in solution of 1 to 10 of water; sulphate of iron (green vitriol); sulphate and chloride of zinc, and nitrate of lead, in the same solution.

As antiseptics we have creosote and carbolic acid, derived from distillation of coal, and which is the most powerful and cheapest antiseptic that we have. This substance enters largely into the composition of a number of materials, as McDougall's Disinfectant, Cliff's Antiseptic Fluid, etc., which are just now offered to the public. Dr. Vœlcker next considers the application of disinfectants, according to the particular object: 1. For treating animal carcasses. 2. Disinfecting cowsheds, etc., where disease has been. 3. Manure. 4. Pastures. 5. Cattle trucks, barrows, stable tools, clothes, etc.

The manure may be sprinkled with solution of chlorate of lime before moving, then a good layer of quicklime when put in the barrow, and taken to a field, and made into a heap, consisting of alternate layers of soil, manure and lime; 5 cwt. of lime to each tun of manure. At the end of three months the heap may be turned and ingredients mixed, and after lying another month, Dr. Vœlcker considers it might be safely used.

The pastures which diseased cattle have inhabited should be left without stocking for some months, the clots knocked about, and 100 bushels per acre of quicklime applied.

Trucks, barrows, etc., cleaned thoroughly with soft soap and water, and then washed with a solution of chloride of lime.

Laborers and inspectors must also be disinfected—the latter, it was suggested, might keep at each farm, where animals were diseased, a pair of pattens, and stump about the sheds in these. The boots of attendants should be most carefully washed in the caustic soda, or else the men made to pass over a layer of fresh lime, and it strikes us as an excellent plan if the entrance to the sheds and premises generally were daily strewn with a layer of quicklime.

Lastly, the question of prevention was slightly touched upon, rather to point out how very little we really knew about antiseptics, and how desirable some thoroughly exhaustive experiments would prove than to suggest anything. Perfect isolation was pointed out as all important; then the distinction of contagious matter. The use of carbolic acid in weak solution (1 to 100) to wash over the animal's body and sprinkle about, might, probably, be a wise precautionary measure, and could do no harm.

The most noticeable remarks in the discussion that followed were those of Colonel Talbot, who related his experience in a dairy of over one hundred cows, at Sudbury, about six miles from London, which, till within a week, had escaped the plague. He had employed Burnett's Fluid (chloride of zinc) to sprinkle about, and wash the animal's body, and had also given internally charcoal daily and niter occasionally. Whether this treatment has been of any use he could not say, but up to the time stated no disease appeared. His treatment of the disease, which he could not trace to any contagion, was as follows:—First, if the bowels were constipated, a mild aperient should be given, consisting of one and a half pounds of treacle, two or three ounces of salts, two table spoonsful of sulphur, and a bottle of Day's Fluid; after some hours, a dose of warbena—a patent medicine of Dr. Collis Browne's, much resembling chlorodyne. If not cured in two days, he tried hydropathy, as recommended by Mr. Graham, of Capheleie; and if this was unsuccesstul, he applied external stimulants to the region of the abdomen. According to Col. Talbot's account, the effects of the warbena had been most remarkable, as, although the disease only first appeared a week or ten days ago, several animals were considered to be recovered, and one was giving nineteen quarts of milk daily.—*London Field.*

A DENTIST published an article in the *Dental Register* for December, 1865, on the steam gage, wherein it was stated that at a heat of 320° the pressure was 30 pounds per square inch. Some error occurs here, for the pressure of steam at 320° is 75 pounds per square inch by Regnault's scale and Fah. thermometer.

NEW INVENTIONS.

Combined Watch Key, Toothpick and Toggle; and Combined Watch Key and Toggle.—Two articles of jewelry with the above titles form the subject of two letters patent issued on the 20th inst. to Richard Cross, manufacturing jeweller, 54 Friendship street, Providence, R. I. Both articles are neat, ornamental, and useful. The one combines, in one article, a toggle for preventing the watch chain from slipping through the button-hole of a gentleman's vest, a watch key, and a gold toothpick—the latter being concealed in the toggle so as to prevent it from being injured; the other combines in one article a toggle and a watch key; and in this case the toggle may be of the usual or any appropriate style externally, the key being arranged to fit inside the toggle, so as always to be protected against dirt, etc., getting into the keyhole, and the key may be detached from the toggle for winding the watch, which can be done more easily than where the key is attached to a bunch of keys, or the like. Both articles are ornamental, and the several functions which each will perform recommend the articles for general use.

Pump for Oil and Other Wells.—The object of this invention is to produce a pump which can be used under the liquid to be raised, and which can be worked effectually at great depths. A vacuum is formed, both at the top and the bottom of the cylinder, without the use of the ordinary articles outside water ways, a valve chamber being formed in the top of the cylinders, and the sides of the cylinder being perforated with numerous holes to admit the liquid to the valve. H. A. M. Harris, of Philadelphia, Pa., is the inventor.

Stereoscopic Instrument.—The object of this invention is to so construct or arrange a stereoscopic instrument that when not used it can be folded up in a compact and convenient shape for being carried about the person, and when unfolded for use the picture-holder can be readily adjusted to the proper focus corresponding to the eyes of different persons; and it consists in attaching the head-piece of the instrument, or that in which the lenses are hung to any suitable bed plate, in such a manner that when the instrument is not in use it can be swung down and upon the same, together with so attaching the diaphragm or partition plate for the two lenses of the instrument, to confine the vision of each eye to its appropriate picture, to the said bed plate that it can be folded down and upon the same, while, at the same time, when the instrument is to be used, by swinging the said diaphragm up and into its proper place, the holder for the lenses is securely held in an upright position thereby; the frame in which the picture is placed being arranged upon the bed plate of the instrument in such a manner that it can be moved either toward or away from its lenses, and thus adjusted to the sight of the person using the instrument. Antonio Quirolo, of 337 Broadway, New York City, is the inventor.

Horse Hay Fork.—This invention relates to a new and improved implement for unloading hay and depositing it in barns by means of a horse, and which are commonly termed horse hay forks. The object of the invention is to obtain an implement for the purpose specified which may be constructed at a very moderate expense, be capable of being manipulated with the greatest facility, and not liable to be impeded or interfered with in its operation by obstructions in a barn, such as beams, braces, etc., of the framing, and which may be tripped to discharge its load at any point in the path of its upward movement, however much it may turn while being hoisted or elevated, and whatever position the tripping latch may have relatively with the operator. B. F. Hisert, of Norton Hill, N. Y., is the inventor.

Machine for Cutting Barrel Heads.—This invention consists of a circular concave or disk-shaped saw and cutter head, placed on an adjustable arbor, in connection with an adjustable or swinging rotating clamp, all arranged to operate in such a manner that barrel heads of different sizes or diameters may be sawed with one and the same machine and the work done very expeditiously and in a perfect manner. John S. Thompson, Glen Falls, N. Y. is the inventor.

How is the red color given to watch hands? Can any reader inform us?

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THE WORKSHOPS OF CLINTON, MASS.

"You will take the cars to Worcester, go from thence via the Worcester and Nashua railroad about thirteen miles to Clinton, and look at the workshops there. Some of the fabrics produced are in great demand, and the details will be interesting to our readers. Stop in Worcester a few minutes, if possible, and look in at the 'J. Washburn & Moen Wire Works,' then return and report to me."

So said the senior editor of the SCIENTIFIC AMERICAN to one of his associates a few days ago. Acting upon these instructions, we arrived at our destination in due course of time. What we saw in Worcester we shall tell our readers, privately, in another paper.

We found Clinton a flourishing town of some five thousand inhabitants, with as many churches, stores and hotels as are necessary, and several factories, some of them producing goods of a novel character. As our time was limited we went through only a part of them—the carpet factory, the Lancaster Mills, where ginghams are made, and the Clinton Wire Cloth Co.'s Works. In the Bigelow Carpet Co.'s Mills the most attractive sights were the piles of splendid Wilton and Brussels carpets. The variety in color and design was charming, while the ingenuity displayed in the construction of the looms which wove them was equally attractive. To attempt to describe the carpet power loom, invented by Mr. Bigelow, would be useless, therefore we shall not try. The yarn having been put into the loom and the pattern adjusted with it, the whole intricate and marvelous machine goes on and works out the beautiful design, reproducing in a tangible form the inspiration of the artist who made it.

A hasty run through the Lancaster Mills revealed the fact that they are very active, producing goods in great quantity and of excellent quality. We saw here the largest piece of flooring in one unbroken expanse to be found in the country; no less than *two acres* are covered with looms and young ladies. The goods made here are sold in advance of their production, so great is the demand for them.

From the Lancaster Mills we ran over to the works of the Clinton Wire Cloth Co., which are substantial buildings, plainly built and well adapted for the purpose. They are the largest in the world. It would be treading on dangerous ground to describe the machinery, as it was all constructed specially for the Company, comprising some of the largest and heaviest looms and other machinery we have ever seen. The goods made by this company are standard in quality, and much better than those produced by the old processes. Hundreds of different styles of cloth and nettings are manufactured, embracing all varieties that are made from iron, tin and zinc wires.

The reader will be surprised to learn of the extensive use of wire cloth in the arts and for domestic purposes. We have not, indeed, reached that pass where coats and vests can be made of it, but for some domestic uses it has become a necessity, while in the mechanic arts it is quite indispensable. We here refer to a few branches of the work that especially attracted our attention.

In one room was a huge roll of fine window screen cloth for protection against mosquitoes and other insect pests. We thought while examining it that it must be an immense satisfaction to sit in a brilliantly lighted room, protected by this gauze, on a summer evening, and know that in the outer darkness the musquitoes and other winged annoyances were vainly dashing themselves against the iron-clad windows, seeking admittance and finding none, while the air came in as freely as though there was no interruption. Here also was another cloth to protect windows against unruly boys, and strong enough to resist the attacks of a madman; and, in striking contrast, a roll as light and airy in texture as a cobweb. On the other hand were yards and yards of cloth ready for the manufacturers to work into corn poppers, others for rat traps, both of which are made by the hundred thousand feet.

In the next mill was a roll of the most beautiful twilled cloth we have ever seen, almost rivalling the productions of Tiffany & Co. in fineness and its silvery brightness. These cloths are used in the manufacture of the small hemispherical strainers through which tea and coffee is strained. Many grades of cloth are made for use in thrashing machines, fanning mills and other grain assorters. These have meshes mathematically perfect, and separate wheat from oats, rye, corn, peas and other foreign substances, leaving such as are required for the choicest brands of flour.

We were told that the wheat grown in different parts of the country cannot be screened by the same grades of cloth; Southern Ohio and Illinois requiring one grade, Wisconsin and Minnesota an entirely different one, Oregon and other sections still different grades and meshes. Each of the different seeds and grains require special forms of mesh; all of them are made here in the greatest perfection.

Among the heaviest articles fabricated by this company are the locomotive bonnet nettings, for covering the tops of the smoke stacks of locomotives, allowing the smoke to escape but retaining the sparks and cinders. These cloths are intended to embrace everything needed, running from very fine for wood burners, to the coarsest and heaviest "crimped" cloths for the coal burners. Crimped cloths are so called from the fact that the wire being cold drawn, goes through a peculiar process of bending or crimping before being worked in the looms. The patent for the manufacture of this class of goods is owned by this company. The greatest quantity of flour or meal sieve cloth, for domestic use, is made both from annealed and tin-plated wire. Formerly, these goods were bought by the sieve makers in the roll, and by them cut into squares to suit themselves; now, the cloth is cut at the factory by dies into circular forms of exact diameters, and is thus sold to the makers. By this system all the sieves of the country will soon be of the same size. This same grade of cloth is used extensively in the Western States for provision safes.

Neither time nor space will allow us to refer to all we saw in the factory, but we cannot refrain from mentioning the copper-plated cloth for cleaning cotton, and the galvanized cloth for drying wools; they are coming into general use. The galvanized wire fencing, with its neat and tasty hexagonal design, adapted to fencing in lawns, gardens and deer parks, and also for sections of country where timber is scarce. All this and much more we noticed as we wandered from room to room, and saw how deftly the huge machines caught the wires and put them into place, stopping themselves when a single one was broken, and how easily they were put in motion again when adjusted.

Although this company own all the machinery of the kind in the world, still they do not attempt to monopolize the business. They offer the hand weaver better cloths at prices as low as he can produce them, and sell the manufacturer and hardware dealer at a good margin for profit. The company do not make up any goods, but sell in the piece.

In passing through these works we were pleased to note a peculiarity which we wish was more common; everything here moved with the precision of clock work; everything seemed to have a place and to be in its place.

THE BRITISH MINT.

From the earliest times, and among nearly all nations, gold and silver have been adopted as the most convenient form of money. And though, in more than one country, furs have been employed for the same purpose, and in one cubes of hard-pressed tea, and though at this day shells form the currency in one part of Africa, and lumps of rock salt in another, yet the exception proves the rule that among all nations, ancient and modern, possessing any claim to civilization, the precious metals have been, in theory at least, the standard of value and the medium of exchange. The reason of this is tolerably obvious—gold and silver combining a greater number of the necessary qualifications than any other article of value. The material of which money is to be made should be one which every one desires to possess; and though widely distributed, the supply of it should be limited enough to maintain a high relative value, which should be as little subject as may be to variation. It should be as imperishable as possible, and readily divisible into small portions. Its bulk should be small and its value easily ascertained. Gold meets all these requirements, except the last, more perfectly than any other substance, and silver in a not very inferior degree. In addition to all this, gold and silver are almost the only metals found in the metallic state, and when pure are always of the same quality.

The trouble of weighing the uncoined money, and the almost impossibility of testing its purity, must have rendered buying and selling a difficult matter. Both difficulties were overcome by the simple contrivance which gave a government guaranty for the weight and fineness of each piece. The process of coining was at first extremely rough, and the results were anything but artistic. A ball of metal of the required weight and value was placed on the die, which bore the device to be impressed on the coin. A punch was held in one hand against the back of the ball, and struck with a hammer held in the other, till, after repeated blows, the impression was sufficiently worked up. Only one side of the coin, therefore, bore a device; the rough, irregular mark of the punch being all the impression on the other side. The edges, too, were rough and lumpish. Gradually the punch itself came to bear a slight design, till at last another die, equally artistic with the first, took its place.

The present building was erected in 1810, and fitted up with the larger part of its existing machinery. It is situated on the north side of Tower Hill, and may be at once recognized not only by its size but by the soldiers who are always on guard in front of it, as at one of the royal palaces.

In the first room we enter, we may see, if fortunate, the process of melting and alloying. The gold comes in from the Bank in the form of ingots, bearing the name and stamp of the refiner—usually Messrs. Rothschilds'. These ingots weigh 16 lbs. each, and are worth about £800. Half a dozen of these (after having been carefully assayed), along with the proper quantity of alloy, *i. e.*, one part of copper to eleven parts of gold, are melted in each crucible; the crucible itself being made of a mixture of Stourbridge fire-clay and plumbago. When thoroughly melted together (which may be after an hour and a half or two hours in the furnace) the precious mixture is cast in iron molds into the shape of bars two or three feet long. These we may follow into the next room, and see gradually reduced, by repeated rollings, nearer and nearer to the thinness of the future coin. In the case of gold, where the utmost possible exactness is required, each bar (or strip, as it may now be called) has to undergo a more exact adjustment to the required dimensions, by being drawn between two fixed steel rollers, which are placed at precisely the correct distance from each other. The ease and exactness with which this powerful machinery works is truly admirable. It bears the maker's name, "H. Maudsley, 1816," and is still in perfect working order, and scarcely ever needs repairs. As the golden ribbons are turned out by this machine, they are cut into convenient lengths, and a blank coin is stamped out of each and carefully weighed, as a further test that the thickness is correct.

And now let us come into the "cutting-room," where, amid din and noise hardly less than in the "rolling-room," the blanks are being cut out one by one from the golden ribbons. One is reminded of cutting gun-wads from a sheet of pasteboard; and the ribbons, when all the possible blanks have been punched out of them, look like the same sheets of pasteboard when used up, though they are a trifle more valuable! The punches are of course worked by machinery, and there may be a dozen or more of them, incessantly going up and down with almost resistless force, each being a sort of refined edition of the engine which every one must have seen for cutting out rivet-holes in boiler-plates. By the side of each sits a workman with his strip of gold ribbon, out of which he lets the descending punch cut, one by one, as many blanks as there is room for. After we have watched the process for a minute or two, we begin to wonder what check is kept on the workmen to prevent their appropriating a stray blank or two out of the heaps which are lying about in such profusion and confusion. On inquiry we learn that the exact weight of ribbon given to each man is set down; and that not one of the men can leave the room till the weight of the blanks returned, *plus* that of the ribbon waste, is found to tally exactly

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with the original supply. Were there a deficiency, the men would be searched; and if the missing gold could nowhere and nohow be found, the whole set of men (as has once happened) would be dismissed.

As a preliminary process to the coining, the blanks are next made to pass through the "marking machine," by which their edges are smoothed and raised. All blanks go through this process, which gives the final edge to bronze coins and to three-penny pieces; the other silver coins, as well as the sovereign and half-sovereign, have a milling put on subsequently. By this time they have become so hardened as to be scarcely workable. To remedy this they are next annealed, and are subsequently cleansed from tarnish or oxide by an acid bath. The effect upon the silver blanks is almost magical. A few minutes in the bath changes them from nearly black to delicate frosted white. A drying in hot sawdust follows, and they are then ready for the final process which will change them from blanks into perfect coins.

Let us follow them to where this transformation takes place. We soon find that we must make the utmost use of our eyes, for the noise is so great that to hear our guide's explanation of what we see is out of the question. The first thing that catches the eye is a solid stone counter, evidently built with a view to immense firmness, which runs the whole length of the room. Along this, at regular intervals, screw-presses of vast strength are at work, having the same up-and-down motion which we saw in the blank-cutting engines. Instead of the punch, however, it is a steel die which ascends and descends, engraved with the device to be impressed on one side of the coin. The reverse die is fixed, immediately underneath, on a solid block, which has to resist the whole pressure (equal to thirty-five tuns) of the descending shaft. Fitting somewhat loosely round this lower die, and rising slightly above it, is a steel collar, on the inside of which is cut the "milling." The huge machine is perfectly automatic. A supply of blanks having been placed in the little funnel which feeds it, a metallic finger places the bottom blank exactly within the steel collar upon the fixed die. The next moment, quietly but with crushing force, the upper die descends upon it. Each die leaves its impression as quickly, and apparently with as much ease, as if the material were hot sealing-wax instead of cold metal. At the same moment the edges of the blank swelling out against the collar, take the pattern of the milling. Simultaneously with the rise of the upper die, a lever causes the collar to sink, the new-struck coin is released, and the arrival of the next blank knocks it off into the receptacle below. The whole process from first to last may have taken three seconds, probably less. The eight presses in this room can, if needful, turn out two hundred thousand coins a day; their average number may be sixty thousand or seventy thousand.

Let us follow the coins one stage further. We find ourselves in a room as quiet as the last was noisy. Yet here too are a number of automatic machines ranged down the middle. They present, however, the greatest possible contrast with those we have just left; for instead of vast strength and power, their characteristic is exquisite delicacy; indeed, each of them works under a glass case, and is not larger than a moderate sized drawing-room clock, though they are worth £250 a piece. But what are they? What are they doing, each with its little pile of bright new money? They are self-acting weighing machines; so accurate and so clever in their working, that one might almost fancy them alive. One by one the coins place themselves on the end of the scale beam, linger a second there, and then drop down a little covered way into one of three boxes—if of the correct weight, into No 1; if too heavy, into No. 2; if too light, into No. 3. A quarter of a grain over or under the standard weight (123,273 grains) is allowed as the limit of variation in a sovereign, and something more in the case of silver money. If the excess or defect be greater than this, the coin is rejected and must be remelted. This happens with about fifteen per cent of the whole.

We despair of conveying any idea of the principle on which these exquisite machines work, without the help of elaborate diagrams.

The finished and perfect coins are put up in bags of a given weight, ready for the final process of pyxing. This consists in subjecting a couple of coins taken at random, from each bag to a further testing by weight and assay. Now and then the greater "Trial of the Pyx" is held, at which the Lord Chancellor or the Chancellor of the Exchequer presides, with members of the Privy Council as assessors, and a jury chosen from the Goldsmiths' Company. The coins are first tried by weight, and are then melted into a bar, from which the assay trials are taken. A favorable verdict proves that the officers of the Mint have done their duty, and gives a public attestation of the standard purity of the coins.

We may add a word or two respecting the dies used at the Mint, the die-room being generally the last which visitors are shown over. The original die, in hard steel, as engraved by Mr. Wyon, is never used in the coining press. A copy in relief is taken of it in soft steel by means of pressure. This is hardened by some undivulged process, and serves in turn as the matrix for the actual die (*in intaglio*) to be employed. The wear and tear is so great that a die seldom lasts above one day, and sometimes breaks under the first stroke.—*St. James Magazine.*

The Largest Marine-Engine Shop in France.

The most important marine engine manufactory establishment in France is that of M. Mazeline at Havre, and the chief productions of the establishment have been the steam machinery for the following iron-clads of the imperial navy: the iron-clads are the *Couronne*, *Normandie*, *Magenta*, *Solferino*, *Flandre*, and *Heroine*. The *Couronne* and *Heroine* it may be stated, are iron ships, and the only iron ships of the imperial navy, except some batteries, transports, and dispatch vessels. In addition to the steam machinery of those iron-clads, M. Mazeline has furnished the engines and boilers of the *Amazone*, *Impetueuse*, and *Audacieuse* of the imperial navy. At present there are in hand, in the establishment, the engines for a large frigate building at Brest, and the engines of several small screw vessels.

M. Mazeline's facilities for the manufacture of steam machinery are considerable. Several buildings, detached from each other, cover an area of twelve acres; and, in addition, there is a boiler-making shop in a different locality from the other works. The works, as in like establishments, embrace the machine and erecting shops, founderies, smithery and forge, pattern shop and boiler shop.

The whole of the central or main part of the roof and frame work is supported on two rows of columns longitudinally, and the columns divide the building internally into three separate divisions. They also support the traveling cranes which carry all the heavy weights from end to end of the building. On either side of the columns there is a line of shafting from which all the machines are driven. The center division of the building is the erecting shop proper, with the heavy lathes, boring machines, planing and slotting machines, etc., near the columns; the space between these columns, the whole length of the building, is available for putting the engines and other heavy work together. The arrangement is one of great convenience for moving of heavy shafts, forgings, and castings for the machines, or *vice versa*, by means of over-head traveling cranes.

The machinery, tools, and appliances are of good descriptions, and the work executed is of a high character. Many of the tools are the production of Whitworth & Rigby, of England, but several are the invention and manufacture of M. Mazeline. Among the latter may be named two vertical planing machines, and moving tools, worked by screws, having seven feet stroke. Each of these machines is operated by a small engine, built in the machine frame vertically, so that the machines are not dependent for driving on the other machinery of the establishment. This is a contrivance admitting of application to all heavy lathes, boring mills, planing, slotting, and other heavy engine factory machines. The advantages are, first, the speed of the machine is directed under the control of the workman; second, in the event of any of the machines being operated after the usual working hours, the main engine, together with the whole shafting of the establishment, do not require to be kept in motion; third, accident to the main engine does not interfere with the working of the detached machines. This last advantage will be best appreciated by those who have witnessed the machinery of an entire establishment standing idle a whole hour, while a main belt was undergoing repairs. One of the chief machines in the erecting shop is a great lathe, manufactured by M. Mazeline at a cost of 87,000 francs. This lathe is geared to move at a speed of from three to fourteen revolutions in the minute, and in it at present is an immense three-throw crankshaft for the engines of the large frigate now building. Those engines, it may be stated, have three side-by-side horizontal back-acting cylinders the middle one being used solely for expanding the steam from the outside ones. Of the other machines worthy of note is one for turning the wrists of crank shafts of any dimensions by placing the shaft in a fixed position and revolving movable cutters round the wrists. This arrangement obviates the use of immense costly machines for the work, and saves the power and inconvenience of revolving such great weights from the centers of huges lathes. The dimensions of the building, roughly measured, are 290 feet long by 180 feet wide.—*Dock Yards and Iron Yards of Great Britain and France, J. W. King's Report.*

LAKE SUPERIOR MINING.

The copper of Lake Superior is native, *i. e.*, it is the pure metal, and not an ore—mixed but not alloyed with other substances. There are but two or three ore mines in the Upper Peninsula, and none of them are as yet of comparative importance. The copper is found in different strata of rock, both on the surface and at various depths in the earth. It is deposited in immense masses, in small nuggets, and in grains diffused throughout the rock. The geological laws governing these desposits are complex, and far from being fully ascertained. The belts of rock, in which the mineral is found, are called lodes or veins, these terms being generally used indiscriminately, although there is some slight technical distinction in their meaning. The surface indications of the existence of copper are not very marked and furnish no reliable evidence as to the richness or extent of the underlying deposits. When its copper-bearing rocks are parallel with the adjacent strata, they are said to run with the formation, but when they strike them at an angle they are said to run across the formation, and are called fissure veins.

A high and precipitous bluff, if the indications justify it, is selected for the location of a mine, as greatly facilitating the operations on the surface, and affording important advantages for ascertaining the extent and value of the mineral deposits. A gang of men commence at the top of the bluff, mining downward; digging a pit generally seven by twelve feet in dimensions. This is called a "shaft," and the work of excavation is termed "sinking." A shaft is either perpendicular, or else "sunk upon the vein," that is in the strata of copper-bearing rock when that has been reached, before taking its "dip" or slant. Every mine possesses at least two shafts, and usually more. At a certain depth from the surface, generally about ten fathoms, a tunnel, seven by five feet in dimensions, is started horizontally, running along the vein and connecting with the other shafts. This is called a "level," and the work of excavation in this case is termed "driving." The shafts are some hundreds of feet apart, and when thus connected, a strong current of air blows through the mine giving it thorough ventilation. The work continues still deeper. The shafts are sunk ten fathoms more, and connected by another level, and so on *ad libitum*, and in the mining vernacular these successive galleries are spoken of as the "ten-fathom level, twenty-fathom level, thirty-fathom level, etc." From the foot of the bluff, also, work is generally commenced, and an opening is "driven" horizontally into the rock, connecting with one of the first levels. This is styled an "adit," used for purposes of drainage and ventilation, and often as a means of entrance and egress. The shafts, levels, and adits constitute the mere skeleton of a mine, and this preliminary work, which requires months of labor and immense outlay, is called "opening the mine," and not until it is complete can the production of mineral in any considerable quantities be attempted. The shafts are provided with a series of narrow ladders,

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each from 30 to 40 feet in length, which are securely partitioned off and firmly fastened, and by which the miners ascend and descend. The shafts are also provided with massive hoisting apparatus, a large bucket being used in case the descent is perpendicular, but a tramway and a car known as a "skip," if it is inclined. Tramways are all placed in the levels to transport the rock to the shafts, provided with small cars. A large pump is carried to the lowest depth of the mine and kept continually in motion, and in occasional cases artificial ventilation is furnished in remote portions by means of air tubes, connected with a fanning machine on the surface.

When the mine has been thus opened and the necessary machinery provided, parties of miners commence to "stope," to remove, by blasting the rock which either surrounds or contains the mineral. "Stoping" is therefore the main business of the mine, to the wants of which all the other operations are subservient. "Stoping" parties, with one of the levels or shafts as their base, take out all the "vein matter," as the copper-bearing rock is termed, leaving here and their natural pillars to sustain the ponderous roof, whose weight, no timbers, however massive, could support. The copper is often found in enormous masses, and then it is handled with great difficulty. It cannot be drilled, and it is too tenacious to be blasted. The rock is therefore removed from its surface as much as possible, and holes are drilled below it. Immense sand blasts, consisting of many kegs of powder, are placed underneath, and by several of these it is torn from its stony fastenings. In the Minnesota mine, a mass of copper was found which weighed 450 tuns, and in one of the sand blasts, which were placed under it, 33 kegs of powder were used. At the same mine, a mass of copper of about five tuns, found some 18 feet beneath the surface was thrown by one of these large blasts through the over-laying earth high in the air, and fell many feet off in a deep ravine. When these masses are too heavy for handling, or too large for transportation through the narrow levels, they are cut up with coal chisels, a tedious but the only efficacious process. The copper is also obtained in small pieces of a few pounds, and this is called "barrel work." Mass and barrel copper are generally freed from all the rock possible with the pick and hammer, and thus shipped for smelting. The third variety of the mineral is found in small grains scattered through the rock, and this is crushed in the stamp mills, freed from the rock by washing, and shipped under the name of "stamp workr." Considerable native silver is found mixed with the copper, but most of this is abstracted by the miners, and never reaches the company. The Cliff mine, however, obtained $1,800 worth of silver from their stamp work last year. Openings, similar to the shaft, are frequently made for various purposes from one level to another, or from a level to the surface; these are called "winzes." Often, also a species of "level" is started at right angles with the general openings of the mines, *i. e.* running across instead of with the formation of the copper-bearing rocks; this is termed "cross cutting," and is generally used for "prospecting," or determining the character and value of the adjacent strata.

This account would not be complete without some brief allusion to the enormous amount of surface improvement, which is as necessary to the successful prosecution of mining operations as the underground labor. The ground has to be cleared, and houses erected for the accomodation of the officers and employes of the company. Miles of road are made to connect the mine with the nearest port, both to secure supplies and also a market for the copper. Ponderous and expensive machinery must be imported, and stamp-mills machine-shops, forges, kilns, sheds, barns and offices constructed. A large dam must be built to secure constant supply of water to wash the stamp rock. An enormous quantity of fuel must be supplied. Few people realize the tremendious consumption of wood resulting from this cause.

The demands of a large mine will clear more than 200 acres of woodland in a twelvemonth. Of course many teams and laborers are required in this department of the business alone Stores, capable of filling the wants of the new settlement, must also be started maintained, and all the chief mines possess their own school house and church. All this must be created from nothing, and in the midst of a barren wilderness. It is only when these things are seen that the beholder commences to realize the enormous capital required for mining operations. The prevalent ideas on the subject are ridiculously absurd, and only those who have personal knowledge can form just connections concerning the matter. Every mine necessitates a village upon the surface, as well as vast underground avenues, and when it is stated that there are nearly one hundred mines on the Lake, the mind begins to comprehend the immensity of copper the interest of this section. —*Merchants' Magazine.*

Correspondence

Western Enterprise.

Messrs. Editors:—I inclose the amount necessary to renew my subscription for another year.

I find that from among all the papers I take, and I take quite a number, yours commands my first attention and is in fact invaluable, and though I am much occupied in the business of cultivating fruits as well as in the business of building the Chicago and Michigan Grand Trunk Railway, from Chicago via St. Joseph to Port Huron, I always occupy a portion of my time in reading the Scientific American for I am richly paid.

The road I refer to is one of those that is a practical necessity, and one that will pay on traversing a portion of Michigan now, an average of 25 miles from raiload lines, and a section equal to any in the west for agricultural and manufacturing business. The population in the counties it will pass through, is 55,683 greater than was on the line of the Michigan Central Railroad in 1850, and 107,703 in excess of that on the line of the Michigan Southern Railroad, and to day exceeds that of the Michigan Central Railroad, excluding Detroit, by 25,487. The line is shorter than any other between Chicago and New York, and the work is of the very lightest kind.

Fruit will be plenty here from present appearances. Peach crop here last year sold for over $200,000.

J. P. Thresher.

Benton Harbor, Mich. Feb. 12, 1866.

The Cinder Nuisance.

Messrs. Editors:—I am extensively engaged in the manufacture of shingles at this point. Burning in my arch, saw dust shavings and etc., all pine. My mill is situated under a hill, on the high ground, and west of my factory are private residences. They complain of the cinders from my smoke stack. I write you for information whether there is any way to prevent cinders, either by burning the smoke or by setting the boiler, or by screens, so as to not destroy the draft. My fuel of course is green. I use a 12 foot boiler with small return flues.

Please answer as early as possible in your truly valuable paper, as the information will be valuable not only to me but to hundreds of others, who desire to carry on manufacturing in cities without any complaint from others. E. H. Hollister.

Rochester, N. Y. Feb. 5, 1866.

[You should use a bonnet on your smoke stack, so enlarged at the top, like a funnel or an umbrella, that the draft will not be checked. You will find several bushels of cinders in the bottom of your smoke box instead of on the neighbors clothes hung out to dry; $3\frac{1}{2}$ x $3\frac{1}{2}$ mesh, No. 13 wire, will answer well.—Eds.

Gear Wheels.

Messrs. Editors:—I have recently observed many articles in your journal, upon setting out gear wheels. Permit me to suggest that the main point is overlooked, which I think is: Are the teeth to be stepped or pitched as chords of the arc, or as so many fractions of the circumferential line?

If the first be correct, the dividers or compasses will be set at the desired pitch at once, and this pitch or chord will be the same for all wheels of the given pitch; and if the latter mode be correct, to get the diameter of a wheel for a certain number of teeth of a given pitch is the simplest matter possible. You multiply the desired number of teeth by the given pitch line, and it will result that the actual pitch stepped off as chords will be different for every different diameter though the nominal pitch be constant.

I have put the above question to those supposed to be well posted, both as mechanics and mathematicians, and I have never yet received either a prompt or positive reply.

I shall be pleased to learn the views of experienced millwrights upon the point. Inquirer.

New York, Feb. 12, 1866.

Gilders' Composition for Frames, Etc.

Messrs. Editors:—The composition at present in use is composed of best black glue, common rosin and linseed oil. Some use rosin oil, others boiled linseed oil. Nearly every manufacturer has a little change in the proportions, but in Europe, as in America, the above ingredients are those used, and are held as a secret. It is a useful material for many other purposes to which it might be applied were its mode of manufacture known.

Take ten pounds of best black glue, boil it in the usual manner, but with very little water. It should be at least four times as thick as carpenters' glue, as used for general purposes. Take six pounds of common rosin, and pound to dust; add linseed oil, or rosin oil, to form a thick paste with the dust, dissolve with heat, allow it to cool to about 212°, then add the rosin compound and the hot glue together; combine it well. Have sifted whiting prepared and combine the whole as in making bread; form it into cakes, and allow it to cool; at any time by the application of steam or heat, this composition may be brought into use. Thomas Taylor.

Washington, D. C., Feb. 10.

Use of an Invention.

Messrs. Editors:—Will you please throw light upon the following query. A person has invented several machines for expediting the manufacture of certain articles, and has allowed the machines to be used for one or two years in his employers' establishment, but nowhere else. Will such use prevent his securing patents if the articles are patentable. Please answer by letters if agreeable to your rules.

T. J. M.

Baltimore, Feb. 14, 1866.

[If an invention has been in public use for more than two years prior to an application for a patent, a valid patent could not be obtained. The use of the invention in your own establishment could not be regarded as public use within the meaning of the law.—Eds.

Note from Dr. Agnew.

Messrs. Editors:—In the Scientific American, of Feb. 10th, I find a report of a lecture recently given by me to home workingmen, "Health, and to How to Keep it." The report is somewhat incorrect, particularly where it says that the British army, in India, lost a brigade a day from the abuse of stimulants, etc. My statement was that, owing to overcrowding in barracks and the large ration of spirits given to the men—6 ounces daily—and want of attention to sanitary policing, the army of 70,000 men lost by death at the rate of a *brigade* a year. A fearful mortality for an army in peaceful camps. The actual death rate produced by the above causes was 69 per 1,000. C. R. Agnew.

New York, Feb. 10, 1866.

The Principle of the Hydrostatic Press.

Messrs. Editors:—Will a tube, say half-inch bore, inserted in a tight, strong hogshead, filled with water, burst open the hogshead upon the tube being filled with water—the length of the tube to be, say, 20 feet or more? An answer will settle a disputed point and oblige A Constant Reader.

Baltimore, Feb. 6, 1866.

[A column of water 34 feet in hight exerts a pressure at the bottom of 15 pounds to the square inch, and at other elevations in proportion. If a tube 20 feet long is inserted vertically into the top of a hogshead, and both are filled with water, the pressure at the top of the hogshead will be about 9 pounds to the square inch; and if the hogshead is 4 feet in hight, the pressure at the bottom will be about 11 pounds to the inch. As this pressure is against each square inch, it will be as many times 9 pounds against the upper head as there are square inches in its area; if

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the head is 3 feet in diameter, it will have an area of 1,017 square inches, and the total pressure against it, tending to push it from its place, will be 9,153 pounds.

If, in place of the confined head, you have a movable piston of the same size fitted into a smooth cylinder, and if your pipe has one inch of cross area with a movable piston fitted into it, then by pressing down the small piston with a force of 9 pounds, you raise the large one with a force of 9,153 pounds; but you raise the large piston through only one-thousandth part of the distance that you press downward the small one.—EDS.

Milling Tool Patterns.

MESSRS. EDITORS:—As you frequently inform machinists on little details connected with the trade, I take the liberty to ask you a question about something that has troubled me.

I recently bought a milling tool of a new and peculiar pattern. I don't know that I can describe it very well, but it was something like the letter L turned upside down all the way round the wheel, as in this figure: ⅂⅂⅂⅂⅂. I applied this tool to a job, but instead of making the same pattern, there was a confused mass of nothing. What is the trouble?

J. J. H.

Philadelphia, Feb. 8, 1866.

[The trouble is in the respective sizes of the work and the wheel. Where such milling tools are used, the circumference of the wheel and the work must agree, or be in the same ratio. If the milling tool is three-fourths of an inch in diameter, the circumference of it will be 2·3562 inches. The surface to be worked on must be divided by this an even number of times. To find the circumference of any given circle, multiply the diameter by 3 1/7th. The confusion arises from one part of the pattern running over the other. If you do not use figures, take a piece of tin, lap it round the wheel, and then make the job four or five times as large, or to suit the wheel.—EDS.

Coating Iron with Copper--Secret Processes.

MESSRS. EDITORS:—Will you be kind enough to send me the address of the gentleman who professes to cover iron with copper? J. E. CARVER.

Bridgewater, Mass,, Feb. 12, 1866.

[We are frequently in the habit of publishing the wants of our readers, and whenever we do so it is sure to bring to us a large number of responses. We can not for obvious reasons publish such replies except as advertisements at our usual rates. We cannot give Mr. Carver the information he seeks, but we presume some of our readers will be able to inform him.—EDS.

THE ALGONQUIN AND WINOOSKI---OFFICIAL REPORT OF THE CHIEF ENGINEERS.

GENERAL INSPECTOR'S OFFICE,
STEAM MACHINERY, UNITED STATES NAVY,
NEW YORK, Feb. 19, 1866.

SIR—The undersigned, appointed by you to conduct the experiments with the competitive machinery of the United States paddle-wheel steamers *Winooski* and *Algonquin*, have the honor to submit the following preliminary report of the result of the trial on Long Island Sound for maximum power of machinery and speed of vessel, and for economy of fuel under these conditions.

It will be followed by a full report, embracing the results of all the trials at the wharf as well as of that on Long Island Sound, together with our conclusions from the same, and all the data *in extenso*.

The trial on Long Island Sound was intended to embrace eight consecutive double runs, between Execution Rock Lighthouse and Faulkner's Island Lighthouse, passing round both. Each double run measured on the vessels' tack was, according to the coast survey chart, 113 geographical miles; but a violent storm accompanied by weather so thick as to prevent the lights being seen beyond a mile or two, and the refusal of the pilots to run in it, terminated the trial after the *Winooski* had performed three double runs, or 339 geographical miles and the *Algonquin* two double runs, or 226 geographical miles. Our data and results are accordingly for these distances respectively.

Neither vessels steered well, but they were about equal in this particular, which, of course, still further lessened their speed. The machinery of both vessels was in excellent order. That of the *Algonquin*, after the completion of the wharf trials, had been for two and a half months in the hands of the contractor for repairs, during which time he had renewed all the vertical tubes of the boilers, substituting a new circulating pump.

In the course of the trial the feed pump worked by the main engine was inoperative ten and a half hours, during which time the boilers were supplied by the auxiliary steam pump; as, however, this pump draws the feed water from the hot well, its substitution in no way affected the performance of the machinery. The counter balance of the eccentric broke at the commencement of the trial, but its fracture was not of the least importance. A paddle on one of the wheels was also broken; but it took place on the return of the vessel to port, and not during the trial.

On board the *Algonquin* the blower was used, but as it delivered the blast into an open fire room its efficiency must have been very small. The steam jet in the smoke pipe was in use, and, with a boiler pressure of 68 lbs. per square inch above the atmosphere, was doubtless very efficient in forcing the draft. On board the *Winooski* the blowers were not used. They are two in number, driven by an independent steam cylinder, and delivered their blast into the ash pits of the boilers, which are closed by air tight doors; when employed, an enormous rate of combustion can be obtained, and a supply of steam much exceeding that used during the trial. A steam jet (a duplicate of that of the *Algonquin*) in the smoke-pipe was employed during the trial, with a boiler pressure of 38 pounds per square inch above the atmosphere.

At the commencement of the trial the *Algonquin's* draft of water was 8 feet 5 inches forward and aft, and the *Winooski's* draft was 8 feet 10 inches forward, 8 feet 8 inches aft. The difference of 4 inches in the mean draft was an allowance made for the deeper false keel of the latter vessel; both vessels being presumed to be in other respects identical, as they were constructed from the same building directions and mold-loft dimensions.

The boilers of the *Winooski* contain 200 square feet of grate surface and 5,036 square feet of heating surface, and have no means of superheating the steam. The boilers of the *Algonquin* contain 144 square feet of grate surface, and 2,678 square feet of heating surface, together with 1,132 square feet of steam superheating surface in tubes. The boilers of both vessels have water tubes. In the *Winooski* they are vertical and are arranged above the furnaces, according to Martin's patent; and in the *Algonquin* they are inclined and arranged in combination with the superheating tubes, according to the patent of Mr. E. N. Dickerson, who designed the entire machinery of that vessel.

Each vessel has one inclined and direct acting engine. The cylinder of the *Winooski* is 58 inches diameter, and its piston has a stroke of 8 feet 9 inches. The cylinder of the *Algonquin* is 48 inches diameter, and its piston has a stroke of 10 feet.

The space occupied in the *Winooski* by the machinery and coal is 57 feet 11 inches long, by the entire breadth and depth of the vessel; and in this space there is a coal bunker capacity of 9,429, cubic feet. The space occupied in the *Algonquin* by the machinery and coal is 85 feet 9 inches long, by the entire breath and depth of the vessel.

The weight of the machinery of the *Winooski*, exclusive of the water in the boilers, is 541,718 pounds, and inclusive of the water, 623,918 pounds. The weight of the machinery in the *Algonquin*, exclusive of the water in the boilers, is 629,144 pounds, and inclusive of the water, 701,144 pounds. The distribution of the weight of her machinery was so faulty that when the vessel was fully stowed for sea, with her coal bunkers filled, water in boilers, etc, she had a list of 22 inches to port, giving her port paddle-wheel an immersion of 7 feet 3½ inches, and her starboard wheel an immersion of 3 feet 7½ inches. To bring the vessel upright, there was required a weight of 73 tuns to be stowed on her decks, in the extreme wing, after the hold had been stowed, in such a manner as to place all the weight possible on the starboard side.

The following are the principal dimensions of each vessel, the greatest transverse section, and the displacement corresponding to their draft of water at the commencement of the trial:—Depth 8 feet 2½ inches, length 240 feet, extreme breadth on mean load water line 35 feet; displacement, 1,280·78 tuns; area of greatest immersed transverse section, 263·85 square feet.

During the time the machinery of both vessels was in operation a complete steam log was kept of their performance, in which was noted, in proper columns, at the end of each hour, the number on the counter, the number of revolutions made by the engines per minute during the hour, the steam pressure in the boilers and in the main steam pipe near the engine, the vacuum in the condenser and the position of the throttle valve, the temperature of the atmosphere on deck, of the engine room, of the fire room, of the injection water, of the discharge water, and of the hot well or feed water; also the hight of the barometer in the engine room. An accurate account was kept of the coal thrown into the furnace each hour, and of the refuse withdrawn from the furnaces and ash pits at the end of each watch of four hours. At the end of every half hour an indicator diagram was taken from each end of the cylinder, and the complete data marked on it at the time taken, and of the number of revolutions of the engine per minute, steam pressure, vacuum etc. A naval engineer was always on watch in the fire room and engine room of each vessel. The point at which the steam valve of the *Winooski* closed and cut off the admission of steam to the cylinder, measured on the main crosshead guides, was 6 feet 4 inches from the commencement of the piston on the lower stroke, and 6 feet on the upper stroke. The mean point of cutting off, therefore, was at seven-tenths of the stroke of the piston from the commencement. As the cut-off of the *Algonquin* was not a positive one, the point of cutting off was obtained from the indicator diagrams, and is the mean given by them.

The contract for the *Algonquin's* machinery provides that the entire responsibility is to rest with the said party of the first part, who will make their own working drawings, and arrange and proportion the details of the said machinery in such manner as they shall deem best calculated to secure the most successful operation.

The machinery of the *Winooski* has worked in the most perfect manner throughout, and its performance in every particular leaves nothing to be desired for efficiency in a paddle-wheel steamer. Its durability and reliability could be depended upon for any length of cruising. Its workmanship, material, finish, accessories and appointments are first-class throughout. The machinery of the *Algonquin* is wanting in these particulars, and in proper adaptation for marine purposes. In style, finish and convenience for manipulation, and in all its appointments, it is much inferior to that of the *Winooski*.

We find that the machinery of the *Algonquin* developed only 54·29 per centum of the power developed by the *Winooski's* machinery, and that the cost of the indicated horse power in pounds of anthracite consumed per hour with the machinery of the *Algonquin* was 18·58 per centum more than with the machinery of the *Winooski*, taking that of the latter for units. If the comparison be made as it properly should be, for economy of fuel, by taking the combustible matter of the coal, instead of the coal itself, for the expression of the cost of the power, as the per centum of refuse in ashes and clinker in an accidental and variable proportion, then the cost of the indicated horse power in pounds of combustible consumed per hour with the machinery of the *Algonquin* was 23·28 per centum more than the machinery of the *Winooski*. In this most important guarantee for amount of power and economy of fuel this failure of the contractor is the greatest of all, resulting in a loss of speed of nearly two geographical miles per hour, and a large increase of the cost of the steam power, *pro rata*.

In every point guaranteed by the contractor for the *Algonquin's* machinery he has failed, and we are of the opinion that it is totally unfit for the naval service. The steam logs of the experiments and the indicator diagrams are herewith forwarded.

ROBERT DANBY,
EDWIN FITHIAN,
MORTIMER KELLOGG,
} Chief Eng'rs, U.S.N.

JOHN B. WOLFF will oblige us by sending his Post Office address.

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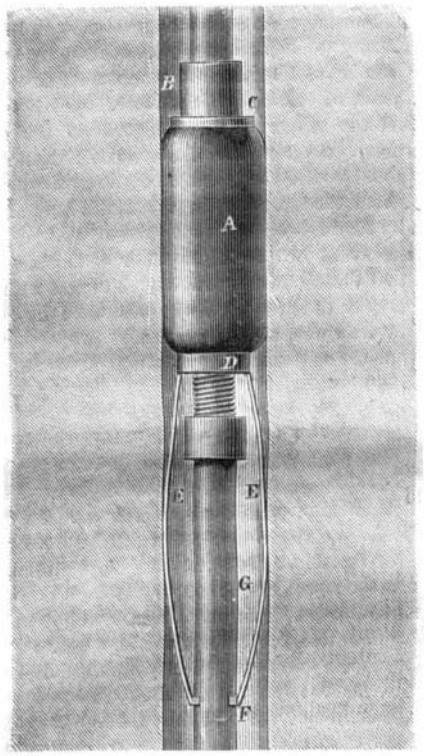
FOWLER'S PACKING FOR OIL WELLS.

The accompanying cut represents what is claimed to be a decided improvement, over the old fashioned "seed bag," for packing oil well tubes. More wells says the inventor, have been totally ruined, that would have yielded a handsome supply of oil with an effective packing, than have proved productive and paying wells by the use of leather and flax seed. With this contrivance, when tubing is to be moved, there is no long delay, no "spearing the bag," no getting leathers fast, nor the thousand and one other vexations and costly hindrances. A simple turn or so of the tubing, and all is free to be taken out or moved up or down at pleasure.

This packing supports the tubing at any point desired, and involves no necessity for perforating or resting it upon the bottom of the well. To loosen or tighten this packing, is but the work of a moment, and may be done with the hands.

The inventor claims that he has overcome the objections which attach the other modes of packing; and has, in fact, a reliable, labor-saving and money-saving well packing. By the following description its working will readily be understood.

A is an elastic substance surrounding the main tubing, B is the ordinary coupling, resting upon the washer C, their surfaces ground together and made water-tight, D is a loose nut, running upon a screw



threat cut on the main tubing. E E, are elliptic springs, dove-tailed or otherwise fastened to the sides of the loose nut D, and partially clasping the tubing at F, also pressing the walls of the well at G, thereby holding the loose nut firmly and preventing its rotation.

By rotating the tubing, from the top of the well, while suspended in the tackle, the loose nut D, is drawn up, expanding the packing and effectually filling the bore of the well.

This improvement is the invention of Dr. A. H. Fowler, of Ithaca, N. Y. for which patent issued Nov. 28, 1865.

For further particulars, address Fowler and Mack, Ithaca, N. Y.

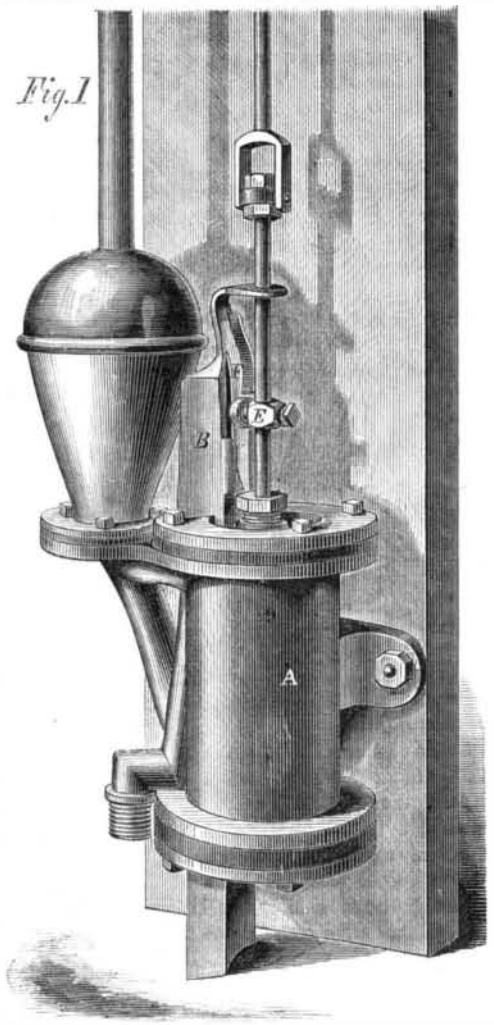
Clark on the Currency.

A very peculiar action on the part of the Treasury Department has lately been made public. The five-cent notes that were formerly adorned with the head of Washington are now disfigured with that of another person, said to be "Clark," of the Treasury Department, he who runs the presses and tends to things generally. What is the reason of this. If any one is chosen to supplant the father of his country, why not select a head with some historic value. Quite a number of persons have heard of Washington, but no one ever heard of Clark, or that he did anything to be entitled to public recognition. What is he on the currency for? Take him off!

BELLINGRATH'S PUMP.

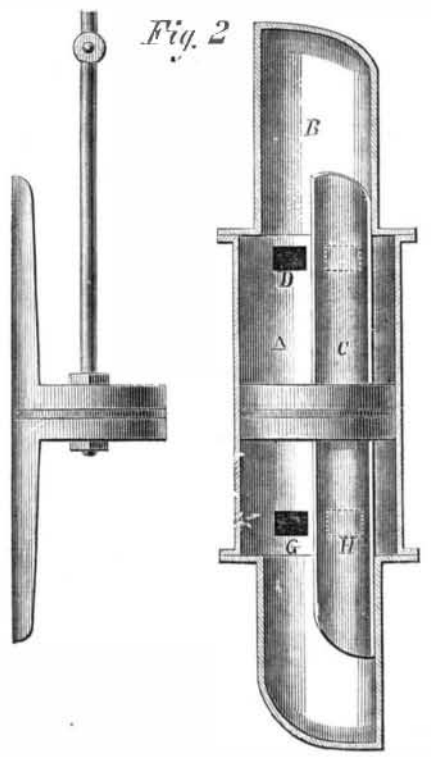
This pump is peculiar in construction, having no valves, but in lieu thereof a piston with projecting flanges, which open and close the water passages alternately by working it up and down as usual.

Fig. 1



In the perspective view, Fig. 1, one form of this pump is shown, and also the means used to operate the piston; the latter, be it understood, turns slightly in the coupling, but is fast on its rod, so that the flanges can open or close the water ports. It may be

Fig. 2



so constructed, however, that the rod remains stationary while the piston turns slightly on it to accommodate itself to the work required.

The details are as follows:—The barrel, A, of the pump has two chambers, B, which extend above it and receive the flanges, C. These latter are formed solid on the piston, as shown in Fig. 2, and cover the ports, D, through which the water enters. These ports are double, one set being clearly shown, while the others are in dotted lines. As the piston rises, the roller on the arm, E, projecting from the piston rod, follows the curved path, F, and causes the piston to move slightly on one side. This covers one set of ports and opens the other set, giving free entrance and exit to the water. Thus, in Fig. 2, the water that would be drawn in through the port, G, open at the bottom, would be discharged through the port, H—shown in dotted lines—when the piston changed its place by moving on one side. In Fig. 2 this movement is given by making the flanges themselves of such a shape at the ends that on striking the head of the chamber they move the piston in the manner previously explained.

This pump has been well and fully tested, and satisfies the expectations of the inventors. Having no valves it can be made to work in any position, and is claimed to be less liable to become inoperative than pumps with valves. Fig. 1 is a deep well pump, but it can be used for all purposes either above or below the water.

A patent was granted on Jan. 22, 1861, by Albert Bellingrath. Application is pending for improvements. Address, for further information, A. & L. Bellingrath, Cuthbert, Ga.

Agates.

The Reese River (California) *Reveille* says that about three miles north of Ione there is an isolated mountain, some five hundred feet high, which is called Agate Mountain. Its entire surface upon all sides, from summit to base, is covered with agates and concretions, and on digging into the soil they are found like potatoes in a hill. The agates are usually oval and sometimes globular in form, and varying from one to four inches in dinmeter, and are generally beautifully banded and striped. In the hands of a skilful lapidary they could be fashioned into pleasing ornaments. The various concretions are found in great abundance, and many of them are particularly beautiful. In their sphericity they are sometimes found as perfect as a ball, though generally the spherical shape is quite distorted. They are hollow and usually filled with crystals. On breaking them open their interior is often found to be irregularly hollow and lined around with a layer of quartz crystals, forming what is termed a geode—a "little crystal grotto." Some of these hollow concretions contain a smaller concretion inside, which rattles when shaken in the hand.

Segar Vessels not Perfect Yet.

Some time back, experiments were made at Havre with a little steam vessel constructed on the segar principle, but they were only partially successful. Since then various improvements have been made in the engines, and new experiments have also been instituted in one of the basins of that town. With two propellers a speed equal to 8·15 knots per hour was obtained, and the vessel was maneuvered with great facility. Screws are about to be fixed to the extremities, and experiments made with them in the Bassin Vaubon, and afterward the vessel will take a trip to sea. On the whole, so far as can at present be judged, hopes are entertained that the new model will prove a success.

Tool Steel.—The great secret of working tool steel is strong hammering, and, in hardening, placing it under a powerful jet of water. Krupp's, or Naylor, Vickers & Co.'s steel tyres, after many thousands of miles run, requires a very strong and hard steel for turning. On the North London and other lines of railway, Mushet's "cyanogen steel" is found to possess these properties in a high degree, being, in fact, weldable, and yet capable of taking an edge of intense hardness and strength. Messrs. Naylor, Vickers & Co. themselves make a quality of tool steel, which, although the price is high, is held in great favor by locomotive engineers who have steel tyres to turn.—*Engineering.*

It is stated that the British Government has dismissed Captain Cowper Coles from his office of superintendant of the equipment of turret ships. It will be remembered that Captain Coles claims to have invented this kind of naval battery.

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Contents:

(Illustrations are indicated by an asterisk.)

*Bedell's Machine for Beveling Carte de Visite Frames	143	Note from Dr. Agnew	148
New Substance for Soling Shoes	143	Milling Tool Patterns	149
A Tight Ship	143	Coating Iron with Copper—Secret Processes	149
Photographic Manipulation	143	The *Algonquin* and *Winooski*—Official Report of the Chief Engineers	149
Hardening Saws and Other Articles	144	*Fowler's Packing for Oil Wells	150
Dr. Voelcker on Disinfectants	145	Clark on the Currency	150
New Inventions	145	*Bellingrath's Pump	150
The Workshops of Clinton, Mass	146	Agates	150
The British Mint	146	Segar Vessels Not Perfect Yet	150
The Largest Marine Engine Shop in France	147	Information Wanted	151
Lake Superior Mining	147	Coffee	151
Western Enterprise	148	A Happy Family	151
The Cinder Nuisance	148	Patent Claims....152, 153, 154,	155
Gear Wheels	148	Notes and Queries	155
Gilders' Composition for Frames	148	*Pries's Improved Orchestrean	158
Use of an Invention	148	An Armor-Clad Turret Ship at Sea	158
The Principle of the Hydrostatic Press	148	Meerschaum Pipes	158
		Hoop Lock	158
		Stuffing Box	158

INFORMATION WANTED.

Some manufacturers in this country use steam power to drive their works. In the various industries many hundreds of thousands of tuns of coal are burned annually; in some instances with frightful waste, in others, at a great disadvantage, in all with very poor economy.

Connected with the employment of steam power there are many intricate and elaborate questions that can only be determined by careful experiments conducted by capable persons. Here is a case in point.

A manufacturer writes to ask what would be the economy of using the same amount of steam he now employs at full stroke in a larger cylinder at a high rate of expansion?

By turning to any of the tables of the mechanical effect of steam at various temperatures and pressures, and by the aid of the common rule for determining the value of certain grades of expansion, it is easy to arrive at a mathematical answer, but this is not what the manufacturer wants. That calculation he could make for himself.

He wishes to know what amount of work has actually been done under or approximating to his conditions and circumstances, by an engine in good order and well managed—not the theoretical but the actual duty.

Any one who is at all conversant with steam power, or has considered the subject, knows that there is no motive agent so influenced by conditions, none so trammeled by the work it has to perform. The experiments with steam engines on the two steamers, *Winooski* and *Algonquin*, in this port, for the last twelve months, prove nothing to satisfy any one, and have merely been the instruments for settling a personal quarrel between two individuals.

The Government has, however, made a set of experiments on a stationary engine, with cylinders of different dimensions, at various grades of expansion, and has obtained a great deal of information invaluable to the people. This information is withheld from them by the Commissioners in charge, Mr. Horatio Allen, of the Novelty Works, and Mr. B. F. Isherwood, of the navy.

There is no reason why it should not be made public; at all events, such portions of the experiments as have proved certain things. The money for these experiments came out of the pockets of the people, not from private sources, as in the Hecker and Waterman experiments, and some explanation of the delay in making them public property should be given.

Why are the results of these experiments not given to the manufacturing community, Mr. Allen?

COFFEE.

Few people ever drink a cup of real coffee, no matter what price they pay per pound, or what care they take in roasting it. It is the final process—brewing it, so to speak—on which all depends; this, of course, assuming that other essentials as to quality and previous preparation have been attended to.

In the article by Baron Liebig, published on page 129 of the current volume of the SCIENTIFIC AMERICAN, many hints are given which, if followed, will prove exceedingly valuable. It is not necessary to expatiate on the virtues of coffee, they are too well known, but a few hints in addition to the article mentioned are here given.

The common way of making coffee is to grind a portion in a mill, throw it in a tin pot and allow it to boil until wanted. Where so made it is wasted, and the volatile spirit evaporated. The fluid which remains is devoid of any tonic or aromatic flavor, and is nothing but a bitter decoction, compared with true coffee. French coffee is not good, because it is so greatly adulterated with chicory, but the method of making it is, and should be practiced to a greater extent, since it involves no more trouble than the old plan. A French coffee pot consists of two tin vessels, one on top of the other. In the top one is a strainer, and a tin plate pierced with holes. The coffee, ground almost as fine as gunpowder, is poured into the strainer, and the plate with the holes put over it. Boiling water is then poured in and filters through into the bottom vessel or pot. The pot should be kept on the range or stove, a few moments, until scalding hot, and the fluid which has filtered through poured in at the top again, which will extract all the flavor of the berry, and make a cup of coffee far superior to that boiled.

Liebig says, however, that a portion of the coffee should be kept out, thrown into the bottom of the vessel, and there permitted to steep, like tea. This, he says, gives the flavor, while the infiltrated portion gives the strength. We have tried this experiment with great success, and find it a vast improvement over the method of simply pouring boiling water on the top; it is, moreover, economical, because the ground coffee is exhausted more completely than by simple immersion in hot water. After standing a few moments, it is as clear as spring water, and as deep colored as claret.

The coffee sold burnt (but not ground), in stores, is as cheap to consume as green coffee. The latter costs less, pound for pound, but the waste which takes place in roasting has to be borne; besides, the imperfect manner, to say nothing of the waste of time in doing it, amounts to more than the difference of price in the two kinds.

To have really good coffee, that strengthens and stimulates, the beverage must be strong, strong in distinction to weak; not dense enough to bear an egg. Persons of weak digestion find that weak coffee creates flatulence and is a burden grievous to be borne, while the reverse is the case with strong coffee. A tea cup full of ground coffee will make from five to six cups as strong as it should be. Of course there are stomachs which can bear turpentine, but they are happily in the minority.

Coffee should never be brought in contact with iron. Tinned coffee pots that have been used for some time are apt to get worn on the surface, so that the iron the tin plate is made of comes through. When this occurs the coffee will be bitter and black, for it attacks iron, forming an acid very quickly. This any one can see by putting a few drops on a case knife.

Above all, to have good coffee, the pot must be scrupulously clean. It should be scalded every morning before using and once a week a piece of soda as large as a walnut should be put in the pot and boiled thoroughly. The result will surprise many who thought their vessels clean.

A HAPPY FAMILY.

In a late issue of this journal we published an article under the head of "Hours of Labor in English Factories," which contained an account of the unhappy condition of many of the workmen and children, and of their moral and physical degradation from causes wholly within control. It is not necessary to reprint portions of the evidence there made public, nor to set forth again the melancholy record. A brighter and pleasanter task awaits us. Last week we had the sorrows of labor, to-day we have the foil in the pleasures, the happy homes and the social joys of some French workmen.

Monsieur Godin Lemaire, the proprietor of a large iron foundery at Guise, France, has exalted ideas of the comfort and well-being of his workmen and provides for them on a magnificant scale. Not content with merely handing out a certain sum weekly through his agents for their support, he does more. He provides a home, and calls the occupants his family. Such indeed it is. He erected two fine buildings on a street in Guise, near a river, and in the center of about fifteen acres of beautiful land, well shaded.

The buildings are four stories high, and built so as to form a hollow square in the center. This is covered in with an immense sky-light, so that in all weathers it can be used as a play ground for the children. Iron balconies are fitted along each story, and access is obtained inside the court to every room or suite of rooms in the building. Every suite has its own cellar and storeroom, and the amplest facilities for drainage are provided. The water is raised by steam to tanks on the roof, and there are fountains that play on every landing, besides hot and cold baths. The dust holes are emptied daily, and the closets three times a day, and the most rigorous cleanliness in other respects is observed.

No time is lost by the house wife in running about town for her supplies. The ground floors are occupied by stores, where vegetables and all other necessaries may be purchased, and this at the very lowest of low rates. All profit above enough to pay the expense of the establishment, accrues to a household fund, thus giving each individual the benefit of his or her economy.

There are many other features of interest in this novel undertaking which cannot be alluded to in detail. M. Lemaire, the proprietor, takes every thing into consideration, and even provides colored worsted balls for the babies of the household, so that all, from the youngest to the oldest, feel his fatherly care.

It is too much to expect that any such establishment will ever be erected in this country, for many reasons. Moreover, it is doubtful whether affairs could be so conducted as to make it agreeable for Americans of all shades of religious belief and social tastes to reside under one roof in the manner described. "Unitary homes" have always descended in the social scale with us, and however honest the individuals composing such communities may be, the world looks upon their motives with suspicion. Some infatuated persons, defying public opinion, form communities and live in a miscellaneous condition, neither coming under the hand of the law nor being respected by the world at large, but this state is not a desirable one for those who value the good opinions of their fellow men. A scheme that would give mechanics good comfortable homes in the suburbs, that would provide every essential of life, that would insist on cleanliness, on outward respectability at least, conformance to the observances of Christian communities, that would lessen the labor of housekeeping by mechanical contrivances of the simplest description, that would save the time of the mechanic in attending to odd jobs after he had done a hard day's work, we say, if such comforts could be afforded at a reasonable sum the value would be inestimable.

Plans somewhat similar have already been carried out, but in a much less perfect way, but we hope the day is not far off when the workman will have as comfortable and as secluded a home as the professional man.

AN English photographer has invented a substitute for the vise, in which is screwed the head of the victim who is to have his picture taken. The new apparatus is fastened solidly to the floor, and as a movable clamp which fits the back, while the head rest is comparatively agreeable.

A SPECIAL train went through from Boston to Portland on Saturday with a single passenger—a gentleman who had engaged his passage on the European steamer, missed the morning train, and paid $300 to be put through in time.

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ISSUED FROM THE U. S. PATENT OFFICE
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☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

52,657.—Head Block for Holding Boots and Shoes.—Isaac E. Allen, Windham, Me.:

First, I claim the combination of the rest, A, the inclined plane, P, the piece, N, having the projection, m, the lever, L, bar, t, and spring, r, arranged and constructed substantially as and for the purposes set forth.

Second, The use, with the above combination, of the block to rest upon the two portions of the inclined plane, P, and of the straps, Q, substantially as and for the purpose herein described.

52,658.—Spring Bed Bottom.—Joshua Barnes, New York City. Antedated Feb. 5, 1866:

First, I claim the combination of the elastic cord passed through the rings with the rods, and tube for the purpose of making an elastic suspension of the slats upon an extensible frame in the manner substantially as above described.

Second, I claim the combination of the movable stanchion with and resting upon the elastic cord coiled around a transverse bar in the manner substantially as above described.

52,659.—Paper and Cloth Collars.—Joseph Barton, Battle Creek, Mich.:

I claim a paper collar with a woven sweat band lining and flexible connection applied between the two pieces of paper forming the exposed part of the collar, and to the inner surface of the band of the collar, the same being an improved new article of manufacture and claimed as such as set forth.

52,660.—Pump.—John Bean, Hudson, Mich.:

I claim the combination of the valve plates, F and G, with the wedge-shaped block, H, the rods, m and n, the arms, k, and the bars, O, the whole constructed and arranged as and for the purpose herein set forth.

52,661.—Press and Strainer for Cream Paste, Etc.—Luman Bishop, Cortlandville, N. Y.:

First, I claim the cylindrical-formed strainer, G, or its equivalent, with screw attachment, in combination with the tube, F, as described.

Second, I claim the lateral apertures, H H, or their equivalents, in combination with the tube and piston, as described.

52,662.—Printers' Chase.—Allen M. Blanchard, St. Louis, Mo.:

I claim a printer's chase formed of four straight bars, A, fitted together, so they may be adjusted to any size or form required, without the use of quoins, substantially as set forth.

52,663.—Sled.—Samuel R. Bowie, Portland, Me.:

First, I claim the combination of the levers, b and c, the plate, n, the rope, e, and pulleys, d, substantially as and for the purposes specified.

Second, The combination of the parts, n b and c, with the device shown in Fig. 3, substantially as described and for the purposes set forth.

52,664.—Churn.—William Boynton, Auburn, N. Y.:

I claim the combination of the frame, B, the shaft, C, the arm, G, the level wheels, m and n, the drawing wheel, P, and air tubes, I, the whole arranged substantially as and for the purpose herein described.

52,665.—Skirt Hoop.—J. W. Bradley, New York City:

I claim hoop skirt springs composed of two or more thicknesses of metal combined together substantially as described.

52,666.—Hand Stamp.—Stephen B. Bragne, New York City:

I claim the attachment of the prepared ribbon directly to the face of the stamp by means of a band or other fastening applied around the stamp substantially as herein set forth.

52,667.—Sponge Cup.—Stephen B. Bragne, New York City:

I claim the combination of the sponge, C, the spring, B, and the cup, A, substantially as herein specified.

52,668.—Hand Stamp.—Stephen B. Bragne and William S. Starr, New York City:

We claim the rotating ring, r, provided with types, and passing through the stationary die beneath the plunger, substantially as set forth for the purpose specified.

52,669.—Pocket Toilet Case.—Francis F. Brainard, New York City:

I claim a pocket toilet case constructed and having a mirror, a pocket for a comb and elastic loops for the reception of scissors, tweezers, and knife, arranged within it, substantially as herein described

52,670.—Well-Boring Machine.—C. N. Briggs, Philadelphia, Pa.:

I claim the combination of the shaft, C, with its cam, G, and the adjustable shaft, D, with its arms, H, and, I, the whole being constructed and operating as and for the purpose described.

52,671.—Hot-air Furnace.—Lorenzo W. Brown and Isaac L. Frankem, Indianapolis, Ind.:

We claim the smoke chamber, D, partitions, O, and air pipes, H, when arranged in combination with the reservoir, B, grate, C, and smoke pipes, G G', substantially in the manner and for the purpose set forth.

52,672.—Lens.—Charles B. Boyle, New York City. Antedated Feb. 16, 1866:

I claim the use of a glass cornea, in front of the objective lens of a microscope or telescope.

52,673.—Process for Gilding and Ornamenting Surfaces.—Morgan W. Brown, New York City:

First, I claim the mode or process of preparing an alkaline silicate preparatory to its use and application, and for the purposes of gilding bronzing, etc., substantially as herein described.

Second, I claim the mode or process of applying the solution of prepared alkaline silicate, and the gilt, bronze and other metallic powdered substances to surfaces in the manner and for purposes substantially as described.

Third, I claim the use and application of certain specified degrees of heat for the purposes substantially as set forth.

Fourth, I claim the use and application to my mode or process of varnishes and lackers for purposes substantially as described.

52,674.—Brick Machine.—Henry C. Bull, Louisville, Ky.:

First, I claim the feed wheel, F, armed with a series of movable blades, F'', operating as and for the purpose described.

Second, The mold wheel, H, provided with the radical compartments, H', and revolving a fixed central cylinder, substantially as set forth.

Third, The arrangement of plungers, J, and their described accessories or equivalents in combination with keys, N, and cross heads, N', or their equivalent devices, for the purposes specified.

Fourth, The fingers, S S', or their equivalents for shifting the movable blades of the feed wheel, in the manner described.

Fifth, The arrangement of exterior plungers, O' O'' O''', for imparting an additional process to the clay, as set forth.

Sixth, The frame braces, q side bars, Q' Q', cross head, R, and their accessories, for operating their exterior plungers, O' O'' O''', substantially as set forth.

Seventh, The arrangement of racks, L' L', pinions, Y', spring catch, Z, shaft, Y, and cam, Y'', for the purpose described.

Eighth, The mold, X, having a movable bottom, X', as described.

52,675.—Hen's Nest.—Charles Campbell, Yellow Head, Ill.:

I claim the wires or rods, i i', or their equivalents, attached to pivoted bar, g, provided with a weight or counterpoise, B, and fitted in the box, A, and all arranged to operate substantially in the manner as and for the purpose herein set forth.

[This invention consists in providing a hen's nest with a pivoted or suspended door, counterpoised and arranged in such a manner that but one hen can enter and sit upon the nest at once. The object of the invention is to prevent hens laying eggs in the nests of setting hens, and also to prevent one hen from driving the other off the nest.]

52,676.—Track Rope Hay Elevator and Carrier.—E. H. Carpenter, Dexter, Mich.:

First, I claim the use of the track and draught ropes, A1 A2, combined with the stops, S1 S2, as and for the purposes specified.

Second, The employment of said ropes and stops, in combination with a hay-elevating and conveying carriage, constructed, arranged and operated substantially as herein described.

52,677.—Valve Gear for Oscillating Engines.—Henry T. Carter, Portland, Me.:

First, I claim the arrangement of the slotted link, K, the valve stem, I, and the oscillating cylinder, A, all as and for the purposes specified.

Second, The manner of reversing an oscillating engine by means of the slotted link, the valve stem, I, the lever, L, and the oscillating cylinder, A, as specified.

52,678.—Machine for Mixing Dough.—George Clark, Jr., Dorchester, Mass., and Lemuel P. Jenks, Boston, Mass.:

First, We claim the arrangement of two vertical rollers, rotating on their own centers, and at the same time rotating round the center of the containing pan, substantially as and for the purpose specified.

Second, We claim the arrangement of rotating rollers, not touching the bottom of the pan, and the removable pan, substantially as and for the purpose described.

Third, We claim the arrangement of a rotating shaft or shafts removable from the dough-containing pan, by means of the turning of the shaft bar which sustains them upon a hinge, substantially as and for the purpose described.

Fourth, We claim the combination of a vertical stirrer or stirrers with a scraper or scrapers, to clean them, substantially as and for the purpose described.

Fifth, We claim the arrangement of a vertical stirrer or stirrers, when the same is or are removable from their respective shafts, substantially as and for the purpose described.

Sixth, We claim the bent plate above mentioned, to prevent the dough reaching the tops of the rollers, used substantially as and for the purpose described.

Seventh, We claim the general combination and arrangement of the whole machine, substantially as and for the purpose described.

52,679.—Cartridge Retractor for Breech-loading Fire Arms.—J. W. Cochran, New York City:

First, I claim the spring, j, in combination with the lever, F, and retracting tooth, i, substantially as herein set forth, whereby it is made to serve as the connection between the said lever and tooth, and as the means of returning them to their proper places on the liberation of the lever after the retraction of a cartridge shell.

Second, The arrangement of the lever, F, and its connection with the retracting tooth, in relation to the breech receiver, stock and breech operating lever, substantially as herein specified.

52,680.—Horse Rake Teeth.—Columbus Coleman, Alleghany City, Pa.:

I claim the use of header, c, movable forms, B and C, and lever, D, when used in connection with the table, A, constructed, arranged and operating substantially in the manner herein described and for the purpose set forth.

52,681.—Counting Machine.—Samuel Comfort, Morrisville, Pa.:

First, I claim the combination of a registering bar, or its equivalent, with the numbering wheels of a machine for indicating or printing numbers or the purpose of securing the correct alignment of the figures during a portion of the operation of the machine.

Second, The combination of the bar, L, with the bar, N, when arranged for joint operation substantially in the manner described, and for the purposes set forth.

Third, The combination of the notches, k, with the notch, k', when arranged in relation to the digital numbers on the numbering wheels in the number and for the purpose set forth.

Fourth, The combination of the bar, N, having a projection, n, with the numbering wheels, K, having notches, k and k', differing in size, for the purpose described.

Fifth, The combination of the oscillating frame, H, having a groove, l, and flanges, m and m', with the crank pin, i, substantially as described, for the purpose of giving the required intermittent oscillating motion to the bar, N.

Sixth, The combination of the crank, C, the frame, F, and the slotted bar, E, and the spiral spring, G, or their equivalents, with the oscillating frame, H, when arranged to operate substantially as described, for the purpose of giving the longitudinally reciprocating motion to the bars, L and N.

52,682.—Self-operating Gate.—Norman Comstock, Westfield, Ill.:

I claim the combination and arrangement of the gate, B, arms, C D E, catches, h, and rods, J, as and for the purpose specified.

[This gate belongs to that class designed for opening and closing without the trouble of getting out of a vehicle or without dismounting from a horse.]

52,683.—Car Wheel.—John L. Constable, New York City:

I claim the combination of the wheels and independent flanges, substantially as described.

52,684.—Cupola or Blast Furnace.—Anson G. Cook, Burlington, Vt.:

First, I claim contracting the lining of the cupola from the inner surface of the hearth at a sufficient distance above the mouth of tweers, to allow the coal or fuel to fill the space between the top of tweers and waist, which prevents the melted iron or metal from coming in contact with the blast air, except as it passes through the burning coal, thereby wholly preventing the carbonization of one portion more than another, substantially as hereinbefore described.

Second, I claim in combination with the waist the receding form and construction of the lining by offsets, which forms the brace for supporting the mass of fuel and metal, and prevents it from resting on the bed of fuel, for the purpose of using bituminous coal or coke, by allowing a free and even circulation of blast through every portion of the contained mass of fuel and metal, substantially for the reasons hereinbefore described.

Third, I claim the form of tweers, the manner of reducing the size of mouth of tweers, for the treatment of very hard iron, the manner of applying or introducing the blast of air into the cupola, through tweers of the size and dimensions described, and the relative position of tweers to the waist, in combination as substantially herein before specified.

Fourth, I claim the mode of operating the cupola in combination with the other features of my invention, by which I melt the iron or metal by such a degree of heat as I desire, by using the bed of coal or fuel of such depth as will produce, with all kinds of iron, such chemical results as I desire, substantially as hereinbefore described.

52,685.—Stovepipe Drum.—Henry Cook, Bluffton, Ind.:

I claim a stove drum having a series of cylinders with loops and projections thereon, constructed, combined and arranged substantially as herein specified, as a new article of manufacture.

52,686.—Watch Key and Toggle Combined.—Richard Cross, Providence, R. I.:

I claim a watch key and toggle combined in such manner that the key shall be concealed within the toggle, substantially as specified.

52,687.—Watch Key, Toothpick, and Toggle Combined.—Richard Cross, Providence, R. I.:

I claim the combination of a watch key, toggle and toothpick, substantially as shown and described.

52,688.—Mill Mick.—Charles Crossley, Philadelphia, Pa.:

I claim the combination of the recessed plate, A, with its flanges, a a', the wedge-plate, C, secured to a handle, e, and the bit, B, with its lug, C, the whole being constructed substantially as and for the purpose described.

52,689.—Vise for Carpenters' Benches.—W. H. Cutter, St. Louis, Mo.:

I claim a parallel vise for work benches, constructed and arranged substantially as above described.

52,690.—Corn Sheller.—Jacob Davis, Oaks, Wis.:

I claim a corn sheller formed by combining the jaws, I and M, the bar, G, and the spring, E, with each other and with the box and frame in which they are placed, substantially as described and for the purpose set forth.

[The object of this invention is to furnish a simple and durable machine for shelling corn. And it consists of a machine by which the corn is shelled from the cob by rolling the ear between a pair of jaws, the corn passing down through the bottom of the sheller, and the cob being ejected at its top.]

52,691.—Milk Can.—John Q. Davis, Salem, N. J.:

I claim the flange, E, in the bottom of the can, A B, and the annular band, F, in the mouth of the same, when they are used in combination with a removable ice vessel, C D, provided with the catch springs, g g, or their equivalents, the whole operating together, substantially as and for the purpose described.

52,692.—Skirt Wire.—Theodore D. Day, New York City:

I claim skirt wire or springs wrapped with a compound covering composed of fine wire and strands of cotton or similar fibrous material, substantially as and for the purposes set forth.

52,693.—Spice Sifter.—Wm. Devines, Brooklyn, N. Y.:

First, I claim the combination of the blocks, W and X, with the sieve, E, cap, S, and box, substantially as described and for the purposes set forth.

Second, The combination of the roller, C', with the plate, D', blocks, E', spring, F', and with the hopper, substantially as described and for the purpose set forth.

[The object of this invention is to furnish a sifter by means of which powdered drugs, spices, flour, etc., may be sifted readily, rapidly, and without dust or waste. And it consists, especially, in the combination with the hopper of an apparatus for crushing any lumps that may be in the material sifted; and, second, in the construction of the stirrer, by means of which the material is agitated while in contact with the sieve.]

52,694.—Apparatus for the Manufacture of Paper Pulp.—Jonn W. Dixon, Philadelphia, Pa.:

I claim the combination of the two boilers, A and B, the coil, P P', and the circulating pump, the tubes connecting them together for the purpose of throwing the digesting liquid, while heated and under pressure, from one boiler to another, substantially as above described.

52,695.—Furnace-door Regulator.—Onvi A. Dodge, Burlington, Vt.:

I claim the arrangement of the pivot, E, opening, H, balls, A and B, pipe, C, with the chains, F F', and furnace doors, G K, whereby to automatically regulate the quantity of air admitted to the furnaces of steam generators, substantially in the manner and for the purpose as herein set forth.

52,696.—Elastic Mallet.—Albert C. Eddy, Providence, R. I.:

I claim an elastic mallet made entirely of vulcunized rubber or of a metallic skeleton incased with rubber, the whole article being substantially as described.

52,697.—Liniment.—David Edwards, St. Anthony, Minn.:

I claim a liniment composed of the ingredients, in the proportions herein described.

52,698.—Sewing Machine for Sewing in Sweat Linings of Hats, Etc.—Rudolph Eickemeyer, Yonkers, N.Y.:

First, I claim the angular guiding plate, I, so applied in relation to and operating in combination with the angular supporting plate, H, as to enable it to move toward and from the latter plate in a direction parallel or nearly so with a line bisecting the angle thereof, substantially as herein specified.

Second, The plate K', for guiding and holding the sweat lining, and the pressing lever, M, and spring, L, in combination with each other and with the angular plates, H and I, substantially as and for the purpose herein described.

Third, Giving the feeding device, beside its forward and backward movement, a movement oblique to the needle and to the angle of the plates, H I, and of the band of the hat, substantially as and for the purpose herein specified.

52,699.—Method of Desulphurizing Coal for Welding Iron, Etc.—John H. Edward, Polo, Ill.:

I claim the use of niter, either crude or in solution, for desulphurizing mineral coal in blacksmiths' fires, substantially in the manner described.

52,700.—Harvester's Rake.—Elias T. Ford, Stillwater, N. Y.:

I claim the combination, as described, forming a contracting and expanding harvesting rake, the said combination consisting of the pivoted centers, d d, links, m m, rake arms b b, and rakes, v, arranged on shaft, t, and operated by bevel pinion, E, on shaft, I, and bevel gear, D, in the manner as set forth and for the purpose specified.

52,701.—Harvesting Machine.—Elias T. Ford, Stillwater, N. Y.:

I claim, First, The tube, D, provided with end boxes, h v h v, and seat sleeve, W i, in combination with the arm, L, left hound, D a, arm, V, with adjusting bar, V F, catches, L, and cross bar, m t, of hounds, D a, substantially as described.

Second, I also claim hinging the pole section, B, to the rear extension of the left and right hounds, D a, D a, formed upon and arranged in relation to the tube, D, and main axle, P Y, as seen in Fig. 1.

Third, I also claim the jack, P h, as composed of lever, P, flanges i i, hinge bolt, v, guide, J arm, e, shank, X e, in combination with the caster standard, X and wheel, T S, hinged upon the lower extremity of arm, V, by the pivot or hinge bolt, v, at the orifice, V Q.

Fourth, I also claim the lever, M, provided with the cavities O* S, formed within the lever or arm, M, for the reception of flange, i, and the steel center bar, and as connected to rear and front bar, N N N, in combination with the guide, J, and lever, K, for elevating and depressing the cutter bar pivoted upon the jack, P h, by the bolt, o t.

Fifth, in combination with the arm, L, supporting the pillow block, L S, secured to the tube, D, I claim the arrangement of the hand lever, T, pivoted below the multiplying shaft, Y, to the pillow block, L S, and provided with the slide, Q, in the manner and for the purpose specified, substantially as set forth in the foregoing specification.

52,702.—Pocket Book.—Wm. T. Fry, New York, City:

I claim the elastic band, with its barbed prongs or their equivalents, in combination with the plate, G, secured to the pocket books and having a projection with an inclined opening, adapted to the reception of the said barbed prongs or their equivalents, substantially as described.

52,703.—Wagon Brake.—C. W. Gage, Homer, N. Y.:

First, I claim connecting the yoke pins of the pole to and with the brakes by means of the connecting rod, R, made in two or more sections, substantially as herein described and for the purposes specified.

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Second, In combination with the above the weighted lever arms m', arranged and operating substantially as and for the purpos specified.

[This invention consists in so arranging and connecting the brake, of a wagon, to and with the yoke pins on the outer end of the pole, that as the horses pull back upon the same, the brakes are caused to bear upon the wheels; and also in a new and peculiar arrangement of parts, whereby the brakes are prevented when so desired from operating or bearing upon the wheels.]

52,704.—Railroad Station Indicator.—C. C. Gale, Columbus, Ohio:

First, I claim the arrangement of the reversible rotating disk, B, spring stop, D, and spring, g, in combination with the cord, b, lever, H, pawl, J, and ratchet, F, arranged and operating substantially as and for the purpose set forth.

52,705.—Mop and Scourer.—W. T. Grant, Jacksonville, Ill.:

I claim an implement consisting of a mop, a mop wringer and scrubbing-brush constructed, combined and operated substantially as herein specified.

52,706.—Grain Huller.—William C. Grimes, Philadelphia, Pa.:

First, I claim the mode as herein described, of hulling corn or other grain by means of a fixed or adjustable plow acting upon it while held by centrifugal force, to the interior surface of a speroidal or other formed shell, as hereinbefore described.

Second, I claim the combination of the revolving speriodal, or other formed shell, A with the adjustable plow, E, for hulling corn or other grain as hereinbefore specified and set forth.

Third, I claim in combination the shell, A, and the plates, F F, to act a semi-plows or gatherers as herein before described.

Fourth, I claim the curved and movable tube, H, in combination with the shell for discharging the hulled grain hulls and meal from the shell as hereinbefore described.

52,707.—Steam and Cut-off Valve.—Elbert E. Groom, N. Y. City:

First, I claim the cavities, g, and the shallow recesses, g', in the piston valves, D, adapted to operate in conjunction with the ports, a a' b b' in the manner and for the purpose specified.

Second, the channel, h, in the steam chest cover in combination with the double piston valves, D E, constructed and operating substantially as and for the purpose specified.

Third, The tapper, p, suspended from the adjustable lever, q, in combination with the hinged latches, S S, toothed rack, K, disk, t, and spring, O, or its equivalent constructed and operating substantially as and for the purpose set forth.

[This invention refers to the use of a double piston valve, each piston being provided with a cavity between its ends to operate in combination with steam supply and exhaust ports in the same manner as an ordinary D valve, steam being admitted through the cavities in the piston to the steam ports, while said cavities serve also to form the communication between the steam and exhaust ports, and small recesses extending from said cavities allow the steam to pass clear round the central portion of the piston valves rendering the same equally balanced and independant of the pressure of steam in which they act.]

52,708.—Hanging Center Boards of Vessels.—J. F. Hall, R. I.:

I claim the swivel yoke, C, in combination with the center board of a vessel, substantially as and for the purpose described.

52,709.—Pump.—H. A. M. Harris, Philadelphia, Pa.:

First, I claim the described arrangement in the cylinder, A, of the lower inlet valve, D, hollow piston rod, B, hollow piston, H, double acting valve, C, annular valve, E e, and openings, a, the whole being applied and combined to operate in the manner set forth.

Second, The arrangement within the hollow piston, H, of the double acting valve, C, when said valve is fitted to the bore of the piston and formed with annular recesses at its upper and under sides as represented.

Third, The arrangement of the annular valve, E, hollow piston rod, B, head, J, cap, G, and openings, a, and for the purpose set forth.

52,710.—Railroad Alarm Signal.—Jabez H. Harris, Point Isabel, Ohio:

First, I claim the mode of automatically raising and releasing a signal board by means of an approaching train, substantially as set forth.

Second, The arrangement of compound levers, C, bell cranks, D and E, rods and chains F and G, triggers, H and I, and spring, L, for the automatic raising and lowering of the signal board, K, by the impact of the approaching tram in the manner substantially as described.

Third, I claim the lever, r, slotted lever, m, in combination with the compound levers, for the ringing of a bell, O, simultaneously with the elevating of the signal board, K, as and for the purpose herein described.

52,711.—Lamp.—Alexander Harroun, Jr., Onondaga, N. Y.:

I claim the regulator, A A in combination with the mica cap, b b.

52,712.—Molasses Faucet.—W. H. Hartman, Fostoria, Ohio:

I claim the trough or spout, B, and head, d, in combination with the barrel, A, and cut-off, E, when arranged and operating as and for the purpose set forth.

52,713.—Farm Gate.—William G. Hermann, Albany, N. Y.:

First, I claim the construction of the roller, D, with flanged guards for the rail, a, of a gate which operates substantially as described.

Second, The latch, l, and supporting catch, g, said latch being formed on the rail of the gate so as to enter between the posts, A A, and support the gate upon said catch, substantially as described.

Third, The combination of a swiveling roller, D, for sustaining the gate at one end with a caster, h, for sustaining the opposite end of the gate substantially as described.

52,714.—Shears for Cutting Bolts.—D. H. Hitchcock, Rockford, Ill.:

I claim the shoulders, a a, on the outer ends of the blades of the shears, for the purposes herein described.

52,715.—Tool for Cutting Gas Pipes, Etc.—William S. Howarth, New Haven, Conn.:

I claim the use of the two flexible cutters a and b, in combination with the adjustal cutter, 9, when the whole is constructed and fitted for use, substantially as herein described and set forth.

52,716. Quartz Crushing.—Daniel Hughes, Rochester, N. Y.:

First, I claim placing the ends of the piston rods, d, loosely into the sockets of the stamper rods, D, substantially as and for the purpose set forth.

Second, The combination of the leather disks, f, with the rotary stamp rods, D, and loose piston rods, d, as and for the purposes specified.

52,717.—Fence.—C. B. Hunting, Clinton, Ill.:

I claim the combination with the rails, a, and battens, b, of the stakes, D E, and adjustable iron bands, c', as and for the objects specified.

[This invention relates to a new and improved portable fence and it consists in a novel construction of the same, whereby the fence may be very readily put up and taken down, and when erected firmly secured in position so as to effectually resist the action of the wind and the effects of stock to prostrate it.]

52,718.—Machine for Weaving Covering for Whip Handles.—Liveras Hull, Charlestown, Mass.:

I claim a mechanical combination comprised not only of machinery for sustaining a whip stock or other article and moving it lengthwise and mechanism for winding one or more threads in a helix about the whip stock or article while being so moved, but also of mechanism for laying binding or connecting threads about the helix coils, the whole being substantially as herein before described, and in combination therewith, I claim mechanism for revolving the whip stocks so as to cause the binding or connecting thread to be laid in a helix therein set forth.

52,719.—Carpenters' Shooting Boards.—Joseph Jones, Newark, N. J.:

I claim the shooting board constructed and arranged substantially as hereinabove specified, as an improved implement or tool.

52,720.—Journal Box.—Edward F. Light, Worcester, Mass.:

I claim a journal box or bearing composed of a base piece, A, cored out as seen at D, and having inclined grooves, l l, in combination with a cap, C, having oil cups, a a, chambers, b b, and holes, e, the parts being all constructed and arranged for joint operation as set forth.

52,721.—Pump for Railroad Stations.—Henry S. Lansdell, New York:

First, I claim the swivel head, g, in combination with the steam pipe a, and ascension pipe, d, constructed and operating substantially as and for the purpose set forth.

Second, The swivel spout e, in combination with the ascension pipe d, and steam pipe, a, constructed and operating substantially as and for the purpose described.

Third, The supporting globe, i, in combination with the swivel spout, e, ascension pipe, c, and steam pipe, a, constructed and operating substantially as and for the purpose set forth.

52,722.—Reel for Grain Binders.—Sylvanus D. Locke, Janesville, Wis.:

I claim an adjustable reel constructed with extensible arms, substantially as and for the purposes set forth.

Second, The combination of nut, D, and movable head or end, E, with the adjustable arms, b, and body of reel, G.

52,723.—Sluice for Quartz Mills.—Hugh Logan, Washoe City, Nevada:

I claim the grooved false bottoms, m, in the compartments, c, of the sections of the sluice, in combination with the longitudinal partitions, b, and pockets, d, constructed and operating substantially as and for the purpose set forth.

Second, The triangular abutments, e f, in combination with the compartments, c d, of the sluice, substantially as and for the purpose described.

Third, The yokes, g, with suitable wedges or keys, in combination with the longitudinal partitions, b, of the sluice, constructed and operating substantially as and for the purpose specified.

52,724—Harvester.—Alpheus Lowmiller, Jewett, Ohio:

I claim the arranging and applying of a sickle to a grain or grass harvester, in the manner as herein shown and described, or in any equivalent way so that the sickle may be moved forward or backward on the finger bar, substantially as and for the purpose set forth.

[This invention consists in arranging and applying the reciprocating sickle to a grain and grass harvester in such a manner that in case the sickle becomes choked or clogged by grass, grain, or rubbish of any kind, the operator or driver may, while in his seat and by manipulating a single lever, draw the sickle back out from the fingers or guards and thereby relieve them from the obstruction, and then throw the sickle forward again to its proper working position.]

52,725.—Iron Frames for Piano Fortes.—August Ludolff, New York City:

The arrangement of the plate, A A' A'', with flanges, B and C, on the underside, in combination with the wrest planks, L and L', against the same, constructed substantially as described.

52,726.—Window Screen.—Abner B. Magoun, West Hanover, Mass.:

I claim an adjustable screen as made of two frames, their guides, and two separate coverings, arranged and combined substantially as and so as to operate as described.

52,727.—Boit-heading Machine.—Merrick D. Marcy, Worcester, Mass.:

First, I claim the slotted bolster or buttress attached to the sliding platform for holding the heading die, substantially as set forth.

Second, In combination with the above I claim the closed heading die, as shown, whereby it can be easily removed to disengage the finished bolt.

52,728.—Machine for Rolling Leather.—Wm. P. Martin, Salem, Mass.:

I claim the employment of a reciprocating carriage in combination with the yielding bed and a suitable mechanism for effecting the described motion of the hand or tool stock, substantially as set forth.

I also claim the employment of the screw shaft, v, in combination with the stationary stand, i, and sliding adjusting bar, h, the whole arranged to operate as set forth.

I also claim the combination of the springs, p, and regulating nuts, O', with their screw rods, the whole arranged to operate with the bed, substantially as hereinbefore described.

52,729—Flour Sifter.—W. C. McGill, Cincinnati, Ohio:

I claim the combination of the stationary case, A, wings, H, the revolving conical seive, G, socket cover, I, and shaft, F, substantially as and for the purpose specified.

52,730.—Mode of Working a Capstan by Steam.—John S. McMillen, Pittsburgh, Pa.:

I claim the arrangement of the wheels, l m n o k j i h and d, shafts, 6 5 4 3 and B, capstan barrel, p, heads, g and r, and pins, 2, the whole being constructed, arranged, and operating substantially as herein described and for the purpose set forth.

52,731.—Wagon Brake.—Joseph McQuead, Mount Stirling, Ill.:

I claim the sliding brake or the bar, B, connected to the shaft, F, by links, E, or their equivalents, in combination with the eccentrics, G G, on said shaft, and the lever, J, connected with the shaft, and all arranged and applied to operate substantially as and for the purpose herein set forth.

52,732.—Shoe.—Frederick Merkle, New York City:

I claim as a new article of manufacture a leather shoe having its uppers crimped and formed of a single piece at the rear, as herein-before specified.

52,733.—Washing Machine.—James M. Meschutt, New York City. Antedated Feb. 9, 1866:

I claim in combination with the box, B, constructed as shown, the use or employment of the sliding washboard, K, and beater, G, when the same shall be constructed and operated substantially as shown, for the purposes herein fully described.

52,734.—Breech-loading Fire-arm.—Isaac M. Milbank, Greenfield Hill, Conn.:

First, I claim, in combination with the swinging breech pin, f, and bolt, g, fitted as specified, the lever, h, jointed to the upper end of the bolt g, and acting to withdraw the same, as specified.

Second, I claim the swinging spring claw, n, in combination with the swinging breech block, f, substantially as and for the purposes set forth.

52,735.—Fire Place.—Allen Moon, Bethlehem, Ind.:

I claim the movable grate, 9', the movable extra back, 10, the regulator with its throat valve, 7, and the sliding front with its pulleys, all operating substantially as set forth and described, for the purpose aforesaid.

52,736.—Car Coupling.—William L. Newell and Jacob S. Simmerman, Millville, N. J.:

First, We claim the inclined and hooked arms, B B, combined with the springs, E E, or their equivalents, the whole being constructed and applied to the cars, substantially as and for the purpose specified.

Second, The combination of the inclined and hooked arms, B B, with the interlocking lever, F F, the whole being constructed, applied to the cars, and operating substantially as and for the purpose herein set forth.

Third, The combination of the above with the levers, D D, the whole being arranged and operating substantially as described.

52,737.—Inner Sole.—Isaac Newhall, Lynn, Mass.:

I claim an inner sole for boots and shoes formed of leather scraps or fillings, coated or covered either upon one or both of its sides with a covering of paper or other similar material, substantially as herein described.

[This invention relates to a new and improved inner sole, especially intended for use in boots and shoes the soles of which are attached to the uppers by means of sewing or stitching, and it consists in forming the body or main portion of the inner sole of leather scraps or fillings, so called, over which, upon either one or both of its sides a covering or coating of paper, cardboard, or other similar material is placed, and secured thereto by any suitable cement, whereby an extremely cheap, light, and strong inner sole is obtained.]

52,738.—Hot-air Furnace.—S. W. Norton, Lemont, Ill.:

I claim the sleeve, E, so arranged with regard to the feed spout, D, of the furnace, and the air blast forced through and across the same, as to be susceptible of being raised or lowered, substantially in the manner described and for the purpose specified.

[This invention relates particularly to a hot-air furnace to be used in connection with grain-drying apparatuses, and it consists in passing an air blast through the products of combustion contained in the fire pot of the furnace in a novel and peculiar manner, whereby it is caused to act upon a greater or less quantity of the combustible products therein.]

52,739.—Apparatus for Pouncing Hats.—Emile Nougaret, Newark, N. J.:

First, I claim the pressing cones, C C, in combination with the punching jaws, D D', and guide piece, f, constructed and operating substantially as and for the purpose described.

Second, The swivel bar, i, covered with sand paper or other suitable material, and applied in combination with the revolving block, E, substantially as and for the purpose set forth.

52,740.—Apple Corer and Slicer.—Robert Onderdonk, New York City:

First, I claim the arranging of the slicing cutters, b, so as to form a hollow semispherical socket to receive and hold the apple while being cut and to obtain a drawing or oblique cut, substantially as set forth.

Second, The combination of the coring cutter, E, slicing cutters, b, semispherical plunger, G, lever, F, arranged to operate in the manner and for the purpose herein specified.

[This invention relates to a new and improved machine for slicing and coring apples, and it consists in having a series of slicing cutters arranged so as to form the half of a hollow sphere, with a tubular coring cutter at the lower end, the above cutting device being used in connection with a semi-spherical plunger to force the apple through the cutting device.]

52,741.—Detachable Rocker for Chairs.—Wm. Pinkerman, Bridgeport, Conn. Antedated Feb. 16, 1866:

I claim the adjustable socket for the rockers of rocking chairs, constructed and arranged substantially as herein described and for the purpose set forth.

52,742.—Piston-rod Packing.—George S. Prindle, Aurora, Ill.:

I claim constructing stuffing-box packing of hollow divided or slitted cones, as herein set forth, so that the steam or other pressure shall close the packing cones around the rod, making a tack joint while allowing the rod to move freely, and shall open and relieve the rod from friction when the steam or other pressure is removed.

52,743.—Cultivator.—George W. Prugh and William H. Beard, Armington, Ill.:

First, We claim combining and uniting in one machine the shaft, J, fitted with a lever and pulley and connected to the cultivator beams, N N and S S, for the purpose of raising and lowering them, and the bell cranks, B P, and stirrups, t t, connected at the top to the two inside cultivator shafts, V V, for the purpose of moving them laterally, substantially as described.

Second, We claim connecting and arranging the cultivator beams, N S and N S', in relation to each other substantially as set forth.

Third, We claim the adjustable connection between the front ends of the cultivator beams, N N', and the hangers, E E, when said hangers and beams are arranged in respect to each other and to the cross tie, Z, and the main frame, A B C, substantially as set forth.

52,744.—Stereoscope.—Antonio Quirolo, New York City:

First, I claim hinging the lens holder to the bed plate of a stereoscopic instrument, in combination with a diaphragm, F', hinged to the said bed plate, the two being arranged together so as to be operated and adjusted substantially in the manner described.

Second, In combination with the above the adjustable picture holder, L, arranged upon the bed plate, as and for the purpose specified.

52,745.—Manacles.—Andrew Rankin, Philadelphia, Pa.:

First, I claim a manacle composed of the portions, c and c', constructed and combined substantially as and for the purpose specified.

52,746.—Flour Sifter.—Henry F. Read, Brooklyn, N.Y.:

First, I claim the combination of the box, hopper, and oscillating sieve.

Second, The packing, f f, at the lower edges of the hopper, in combination with said hopper and the oscillating sieve.

Third, The stationary partition, g, in the hopper, in combination with said hopper and oscillating saw,

52,747.—Tobacco-cutting Machine.—F. W. Kitterhoff, New York City:

First, I claim a device for taking up the wear of the shaft, operating substantially as and for the purpose herein shown and described,

Second, The combination and arrangement of the follower with the hand wheel and screw, arch piece and cheeks of the tobacco box, operating substantially as and for the purpose herein shown and described.

52,748.—Developing Stick.—Thos. C. Roche, Williamsburg, N. Y.:

First, I claim a developing stick composed of a handle, A, and suction pad, B, as a new article of manufacture,

Second, The guard, C, in combination with the stick, A, and pad, B, substantially as and for the purpose set forth.

[This invention relates to a stock or handle provided at one end with a suction pad of india-rubber or other suitable material, in such a manner that, by the application of such suction pad, a plate of glass or other material can be conveniently raised and held in the proper position for applying the developing solution, and all necessity of handling the plate and of soiling the fingers is avoided. The stick is also provided with a guard at about the middle of its length or at a convenient distance from the end carrying the pad in such a manner that the hand of the operator is protected against the liquids which may run down on the stick.]

52,749.—Guide for Folding and Uniting the Edges of Two Pieces of Cloth, Etc.—Israel M. Rose, New York City:

I claim the employment of the spiral-shaped pieces, B and D and E, in combination with the spring piece, C, separately constructed, the whole united with the bed plate, A, in the manner substantially as and for the purposes herein described and set forth,

52,750.—Door Latch.—A. H. Rowe, Hartford, Conn. Antedated Sept. 2, 1865:

I claim as a new article of manufacture the latch constructed as described.

[This invention relates to a door latch, the bolt of which is placed in an upwardly-inclined position, and has its point curved so that when the door is slammed or closed, without raising the latch, the point of the bolt, in coming in contact with the cap, rises spontaneously, and as soon as the door is fully closed it drops down by its

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inherent gravity and catched behind the cap. The use of springs can thus be dispensed with, and a latch can be produced which surpasses in simplicity and cheapness everything heretofore made.]

52,751.—Apparatus for the Manufacture of Illuminating Gas.—Tyler Sabbaton, New York City :

I claim the combination in a gas apparatus, of several distillatory retorts, with one regenerating retort, substantially as set forth.

I also claim the combination of several retorts of a bench, with the hydraulic main by means of one dip pipe fitted with a cup seal, substantially as set forth.

I also claim the combination of the retorts of a bench with a double-chambered superheating retort by pipes in such manner that the steam to be superheated passes through both chambers of the superheating retort before it passes to a distillatory or decomposing retort, substantially as set forth.

52,752.—Wool Packer.—Absalom Saeger, Meadville, Pa.:

I claim the tubes, A and E, in combination with the racks, G G, and the levers, F F, with the follower, X k, and the roller, H, operated by the wheel, C, and the crank, M, when the same are constructed as described and in the aforesaid combination and for the purposes set forth.

52,753.—Horse-power.—G. W. Sanor, Hanoverston, Ohio, and Jacob Stoffer, New Chambersburg, Ohio:

First, We claim the arrangement of the crown wheel, E, master wheel, B, and shaft, F, in combination with the shafts, a' and E, and pinions, a g h, operating in the manner and for the purpose substantially as described.

Second, The shaft, E, having its upper journal within and operating conjointly with the shaft, F, in combination with the disk, D', and shaft, I, loose within said disk, arranged and operating conjointly as and for the purpose substantially as set forth.

Third, The gear wheel, L, and pinions, H, in combination with the disk, D', shaft, I, and bevel pinions, m n, arranged and operating conjointly, as and for the purpose substantially as specified.

52,754.—Cultivator.—John Savill, Monmouth, Ill.:

First, I claim the bent axle, A, provided with arms, a a, in combination with the brackets, C C, containing the wheels, D, and fitted on the arms, a, substantially as and for the purpose set forth.

Second, Connecting the front ends of the plow beams, E, to the upper ends of the brackets, C C, by pivot bolts, b, arranged with circle plates, C, substantially as and for the purpose specified.

Third, The evener or draught regulator, composed of the splinter bars, I I K, connected by the rods, J, and arranged substantially as described.

[This invention relates to a cultivator of that class in which the plow beams are rendered adjustable so that they may penetrate a greater or less depth into the earth, be raised out of the ground when the device is to be turned or moved from place to place, and the plows placed at a greater or less distance apart, as may be desired.]

52,755.—Bottle Stopper.—Augustus Scarlett, Newark, N. J.:

I claim making use of the tube by which air is supplied to the vessel for the additional purpose of conveying the drippings back into the vessel.

53,756.—Burial Case.—Geo. W. Scollay, Washington, D. C.:

First, I claim, in combination with the coffins and a plastic cement, the metallic lining being applied thereto for the purpose specified.

Second, In combination with the coffin a metallic sheet lining made to cover the bottom of the coffin and only a portion of the sides and ends thereof and applied thereto, so as to form a tight joint at the junction of the edge of the lining and the inside of the coffin, thus preventing the fluids or gases from passing down between the lining and the coffin.

52,757.—Clamp for Stages.—William H. Seymour, Liverpool, N. Y.:

I claim the arrangement of the parts, a b c d e g and f, substantially as above described, constructed and made to operate substantially as and for the purpose herein shown and described.

52,758.—Apparatus for Teaching Spelling.—Halcyon Skinner, Yonkers, N. Y.:

First, I claim holding the wheels, b b, stationary when required, by means of the pins, g g, and catches, f f, and releasing them in any required number by the keys, h h, or all together by the key, j and rocking bar, k, substantially as described and for the purpose set forth.

Second, In combination with the other parts described, mounting a series of pictures upon one or more rollers, substantially as specified.

52,759.—Farm Gate.—A. J. Smith and G. S. Hudson, Ellisburgh, N. Y.:

First, We claim the combination of the swinging bar, E, and guide, F, with the rails, C and G, and with the post, B, in a farm or entrance gate, substantially as described and for the purpose set forth.

Second, The combination of the separators, I, with the pickets, H, and rails, C & G, in a farm or entrance gate, substantially as described, and for the purpose set forth.

52,760.—Medical Compound.—William C. Smith, Lafargeville, N. Y.:

I claim a medical compound made as herein set forth for the purpose set forth.

[This invention relates to a compound intended to cure cholera and all chronic diseases of the bowels.]

52,761.—Telegraph Insulator.—W. W. Smith, Cincinnati, Ohio :

I claim forming the insulating block with the reflexed, convoluted or measuring chamber, H, which incloses, without touching the metallic stem or shank of hook, substantially as and for the object set forth.

52,762.—Water Wheel.—Henry Soggs, of Columbus, Pa.:

First, I claim the combination and arrangement of the screw wheel, C, and over-shot wheels, D D', including the gearing thereof, with the shaft, B, so as to admit of a double use of the water, substantially as described.

Second, The combination of the wedges, H H', with the jaws, J, and cap, G, for the purpose of raising and lowering the mill stone, substantially as set forth.

Third, The adjustable gate composed of the half circles, L L', and operated by the shaft, S, and arrangement of levers, substantially as described.

52,763.—Machine for Separating Bristles.—Nathan H. Spafford, Baltimore, Md.:

First, We claim the grooved pulleys, S S, the round belt thereon, constructed and operated substantially as and for the purposes specified.

Second, The endless traveling platform, W, with the anti-friction rollers thereon on the inside, and the small guiding strips on the outside combined with the large pulley, R, and the drums, a a, substantially as and for the purpose set forth.

Third, The three bolts, Y Y Y, in combination with the traveling platform, W, and rollers, a a, when constructed and operated substantially as and for the purpose herein specified.

Fourth, The shaft, E, and worm gear thereon, in combination with the cog wheels, D D, and pulleys, C C and F, substantially as and for the purpose set forth.

Fifth, The arms I I, oscillating shaft, V, with the small rollers on the underside thereof, the boxes, O O, nuts, n n, and the set screws connected therewith, combined and arranged substantially as and for the purpose described.

Sixth, The variable boxes u u, combined with the shafts, P and T, and the pivot boxes, z z, and set screws therein, substantially as and for the purpose set forth.

Seventh, The entire machine, with its described devices constructed and operated substantially as and for the purposes specified.

52,664.—Machine for Extracting Essential Oils.—Vincent Squarza, San Francisco, Cal.:

I claim the compartments, C D E F, having one or more perforated fixed covers, L, adjustable cover, K, with points, t t, or their equivalents, arranged as herein described and for the purpose set forth.

52,765.—Quartz Crusher.—Charles W. Stafford, New York City :

First, I claim the reciprocating roller, H, in combination with the segmental surface or floor, I, substantially as and for the purpose set forth.

Second, I claim the combination of the vibrating lever, C2, jaws, B B' C C', and roller, H, as and for the objects specified.

52,766.—Link Motion for Steam Engines.—N. P. Stevens, Lowell, Mass.:

I claim the arrangement and combination of the rocker, I, the two keys, K H, with the link, A, and the lifter, H, thereof, the whole being constructed substantially in the manner and so as to operate as specified.

52,767.—Churn.—J. L. Stewart, Homer, N. Y.:

I claim the arrangement of the shaft, L, wheels, k J I H, pitman, M, with the tube, D, and revolving churn, provided with dashers, the several parts being constructed and used as and for the purpose herein set forth.

52,768.—Lamp Shade.—Mathew Stewart, Philadelphia, Pa.:

First, I claim a circular shade having the vertical sides, B, consisting of the two grooved rims, b1 b2, and a picture-holding frame, b5, between them, the same being constructed and arranged substantially as and for the purposes described.

Second, In combination with the said vertical sides, B, I claim bending the ends of the arms, C, into the vertical positions shown, together with their respective shoulders, c', and screw nuts, c2, as and for the purpose described.

Third, I claim making the picture or transparency-holding frame, b5, in one entire piece, and irrespective of the number or form of its openings for receiving or holding the said pictures or transparencies.

Fourth, also claim, in combination with the vertical sides, B, of the shade the detached reflector, A, the same being supported by simply resting on the upper rim, b', as and for the purpose specified.

52,769.—Graver.—F. R. Stockton, New York City :

I claim a graver formed by combining two blades, B and C, with each other and with the handle, A, the distance apart of the points of the blades being regulated by the screw, D, the whole being constructed substantially as described and for the purpose set forth.

52,770.—Cultivator.—D. C. Teller, Terre Haute, Ind.:

I claim the arrangement of the vibrating beams, R, in combination with the spring-shding draw bars, E, and crooked arms, m, with the stop, o, substantially as specified for the purpose set forth.

52,771.—Mechanism for Operating the Swell of Reed Organs.—Artemus E. Thompson, Brooklyn, N. Y.:

I claim the combination of the pedals with the oscillating lever board, A, arranged substantially as shown and described for the purpose set forth.

52,772.—Barrel Head Machine.—John S. Thompson, Glens Falls, N. Y.:

I claim the circular dish-shaped saw, E, and cutter head, F, provided with cutters, a, in combination with a rotary clamp, I, fitted to a swinging yoke, H, substantially as and for the purpose herein set forth.

I further claim having the bar, B, to which the supports or bearing, C, of the saw arbor, D, are attached, arranged so as to be capable of being adjusted longitudinally, in combination with the adjustable yoke, H, in which the clamp, I, is fitted; all being arranged substantially as shown and described for the purpose of adapting the machine to cut heads of different sizes or diameter.

52,773.—Wind Wheel.—Henry C. Thrall, Springfield, Mass.:

First, I claim the combination of one or more wings, b, with one or more arms, a, piece, F, and shaft, B, when arranged substantially in the manner and for the purpose herein set forth.

Second, In combination with the combination named in the first clause of this claim the regulator or governor, D, when arranged substantially in the manner and for the purpose herein set forth.

52,774.—Grain Huller.—R. W. Van Peyma, Lancaster, N. Y.:

First, I claim a stone with the periphery corrugated at right angles with the plane of the stone, and grooves, o o, for the purposes substantially as set forth.

Second, I also claim the stone as described in combination with the curb, C, and hooks, bolts, a a, substantially as and for the purposes described.

52,775.—Sluice Box.—R. E. Washburn, San Francisco, Cal.:

First, I claim the adjustable amalgam box, D, quicksilver vat, E, riffles, H H H, or their equivalents, substantially as described for the purpose set forth.

Second, I claim the peculiar shaped tapering grating or bars, B B, arranged as described, for the purpose of allowing the coarser material to pass off without choking, substantially as set forth.

Third, I claim the manner of introducing the water so that it may pass through the amalgam box, D, dividing it by means of the shoots, C and G, the coarser passing down the shoot, G, while the finer material and water passes down G, uniting again at F, so that the box can be used in any part of the flume, substantially as described and for the purposes set forth.

52,776.—Countersink.—A. Williams, Wellsville, Ohio:.

I claim the bur, A, stem, B, provided with a screw at each end, in combination with the nut, C, arranged and operating conjointly as and for the purpose set forth.

52,777.—Derrick.—D. D. Winant, Brooklyn, N. Y.:

First, I claim the arrangement of the grooved barrels, e f, and gear wheels, g h i k l and m, in combination with the shaft and clutch, n, for the purposes and substantially as specified.

Second, In combination with the barrels, e f, and gear wheels, g h i k l and m, shaft n, and clutch n', I claim the friction reel or reels fitted in the manner and for the purposes specified.

52,778.—Liniment.—John W. Woodring, Greensburg, Ky.:

I claim the medicine aforesaid composed of the constituent parts and prepared as aforesaid.

52,779.—Prepared Paste for Book Binders, Etc.—Joseph Woodward, Springfield, Mass.:

I claim as a new article of manufacture the substance herein described.

52,780.—Let-off for Looms.—Edward Wright, Worcester, Mass.:

I claim the construction and arrangement of the let-off mechanism consisting of the pawl ratchet guard lever having loose connection with the whip roll and the friction device, all constructed and operating substantially as described.

52,781.—Head for Picture Nails, Etc.—Heman P. Brooks (assignor to Turner & Clark, Manufacturers, Etc.), Wolcottville, Conn.:

I claim the head for picture nails, knobs, or tassel hooks, formed with a wooden body or nut, and an ornamental metallic covering or surface in the manner specified.

52,782.—Fancy Doll.—Dominco Chickini, Marion, Conn., assignor to himself and L. R. Thompson, New Haven, Conn.:

I claim making the doll's head with four faces, and suspending it in the wig frame in such a manner that the head may be revolved vertically, so as to bring either of the four faces in front at pleasure, when the whole is constructed and fitted to operate substantially as herein described.

52,783.—Screen-cutting Die.—Christopher G. Cross, (assignor to himself and Charles S. Crane), Chicago, Ill.:

I claim a screw-cutting die, constructed of steel and cast iron or other suitable metal, substantially as set forth and specified.

52,784.—Paper Shirt Bosom.—Theodore A. Curtis (assignor to George W. Ray and Varnum N. Taylor), Springfield, Mass.:

First, I claim a paper bosom, made in two parts, substantially as described.

Second, enameling said bosom, substantially as described.

52,785.—Apparatus for Pressing Paper Collars.—J. H. Darlington, New York City, assignor to Joseph R. and Frederick A. Blossom, Brooklyn, N. Y.

I claim the combination of two or more rollers with a central or main roller and with a guard through which the collar is entered to the rollers, substantially as and for the purposes specified.

52,786.—Hay and Cotton Press.—Erastus M. Day and John T. Noel (assignors to H. Winchester and E. M. Day), Lower Lake, Cal.:

First, We claim the arrangement in a ratchet press of the invented ratchet bar, rock shaft, eccentrics and pawls, substantially as and for the purpose herein specified, whereby the ratchet bar is made to serve as a shield for the protection of the ratchet teeth pawls and eccentrics from waste and dirt.

Second, In a ratchet press having the ratchet pawls worked by eccentrics on a rock shaft, we claim the pawls, two for each eccentric, arranged in relation to the ratchet teeth, substantially as herein described, whereby the operation of the ratchet bar, by a longer or shorter stroke of the lever, by which the rock shaft is worked is provided for.

Third, We claim the disengaging cam and its supporting shaft, arranged in relation to the bed of the press, the ratchet bar and pawls, substantially as and for the purpose herein specified.

Fourth, We claim the arrangement of the follower, its attached ratchet bar, the rock shaft eccentrics, pawls, operating lever and disengaging cam in relation to each other and to the bed or foundation of the press, substantially as herein specified.

52,787.—Blacking Brush and Boot Jack.—Samuel Gessinger, Alleghany City, Pa., assignor to himself and Peter Kolbecker, Pittsburgh, Pa.:

I claim the combination of blacking brush and a boot jack, said blacking brush and boot jack being constructed, combined and operated substantially as herein described and set forth.

52,788.—Process for Saturating Wood, Cloth, Paper, Etc., with Parafine.—Stuart Gwynn, of New York City, assignor to Alfred B. Ely, Newton, Mass.:

I claim the use of parafine melted and heated to a high degree for saturating cloth and wood in the manner and for the purposes substantially as described.

Second, Its use for saturating paper when it is used for roofing and other similar outside covering, and for linings for boxes and such like, when durability, imperviousness to moisture and resistance to the action of the elements are desired, as also for linings for hats, shoes, garments and other articles of fibrous materials.

52,789.—Steam Engine.—Alvin Lawrence (assignor to himself, Ambrose Lawrence and John T. Crane), Lowell, Mass.:

I claim the combination and arrangement of the valve, D, with the cylinder, A, or its equivalent, when the said valve is connected with and operated by the governor, substantially as and for the purpose specified.

Second, And in conjunction with the cylinder, A, or its equivalent, the valve chest, E, and valve, D, said valve being connected with and operated by the governor, the use and application of fluid under pressure, for the purpose of operating the throttles, valves or cut-off gear of steam engines, substantially as specified.

Third, And in combination with the valve, D, the same being connected with and operated by the governor, the employment of the spring, H, or its equivalent, for the purpose set forth.

Fourth, And in combination with the cylinder, A, valve chest, E, and valve, D, said valve being connected with and operated by the governor, as above stated, the supply pipe, F, and regulating cock, G, substantially as and for the purpose specified.

Fifth, I claim the general construction and combination of the apparatus, consisting of the cylinder, A, piston head, B, piston rod C, and lever, M, or its equivalent, the valve, D, valve chest, E, supply pipe, F, regulating cock, G, and the governor, the whole arranged substantially as and for the purpose set forth.

52,790.—Mold for Casting Heads Upon Screws, Tacks, Etc.—Duncan McArthur (assignor to Sargent and Company), New Haven, Conn.:

I claim a mold consisting of the parts, A and B, when hinged together upon a plate, C, so as to be operated substantially in the manner as herein set forth.

52,791.—Bottle Stopper.—Eli Morris Jr., (assignor to himself and Edward Heaton), New Haven, Conn.:

I claim the lever, C, and stopper, D, when combined and arranged substantially in the manner and for the purpose herein set forth.

52,792.—Method of Sinking Well Tubing.—R. F. Osgood Rochester, N. Y., assignor to Charles W. Kinne, Cortland, N. Y.:

I claim the cylinder or short section of tube, B, in combination with the tubing, A, arranged in such a manner that in the act of driving, the earth is excluded, but when driven, the water may be admitted by simply turning the cylinder, and without raising the tubing, substantially as described.

I also claim the wire cloth, d, covering the parts, in combination with the cylinder, B, and tubing, A, substantially as specified.

I also claim the valve, F, in combination with the cylinder, B substantially as described.

52,793.—Pipe Coupling.—H. D. Parker, Genesee, N. Y., assignor to C. L. Burtis, Thomas A. Barrows and Eli S. Hart:

I claim coupling the ends, A A, of two sections of rod, by means of the wedging sockets, B B, connecting bolt, D, or equivalent, and wedges, C C, operating substantially in the manner and for the purpose herein described.

52,794.—Fly Trap.—Nicholas Pike (assignor to Emma Taylor), Brooklyn, N. Y:

I claim a box for containing the fly composition with a string, wire or rod arranged in such a manner that by moving either the string wire or rod, or the box, the former may be drawn or passed through the composition and the flies at the same time stripped from the string, wire or rod, substantially as and for the purpose set forth.

I also claim in connection with the string, wire or rod, constructing the lid or cover, B, of the box with a flange, a, to form a fly receptacle as set forth.

I further claim the box, A, cover, B, tubes, E, bar, C, and string or wire, D, all arranged and combined substantially as and for the purpose specified.

52,795.—Fence.—Russel Pronty, (assignor to J. Elder and J. B. Wilson), Springfield, Iowa:

I claim the combination and arrangement herein described of the posts, A A, wires, B, and pickets or slats, C C', when said pickets or slats are provided with oblique notches, a and a', made at different distances apart in the successive or adjacent pickets so as to force the wires into a zigzag shape, and cause the two wires to strain in opposition upon each picket, as and for the purposes specified.

52,796.—Process for Converting Iron Into Steel.—Eliot Savage, West Meriden, Conn., assignor to himself George S. Harwood, and George H. Quincy:

First, I claim the improved method of hardening and tempering steel by heating the same in cyanide of potassium previous to its immersion in a cooling liquid.

Second, The improved mode of treating iron for the purpose of producing upon it the effects of case hardening by heating the same in a bath of cyanide of potassium, and by submerging it in cooling liquid.

Third, The improved mode of treating cast iron for the purpose of converting it into steel, or a substance resembling steel, by heating the same in a bath of cyanide of potassium and submerging it in a cooking liquid.

Fourth, In the method of treating iron, steel and other metals by means of cyanide of potassium as and for the purpose hereinbefore set forth, I claim the use of metallic solutions as the cooling liquid

52,797.—Hydrant.—Edward Stocker (assignor to himself and Emanuel Shober), Lancaster, Pa.:

I claim the stop cock, A, with its curved screw ends, E D, and conic turn point, C B, in combination with the fixed base, F G N, with or without the stop-off key, h, all arranged and operating substantially in the manner and for the purpose specified.

52,798.—Boot and Shoe.—Charles H. Trask and J. B. Johnson, Lynn, Mass. assignors to themselves and G. L. Thayer, Boston, Mass.:

We claim our improved channel, C, as made with two lips, i k, arranged so as when closed to meet together directly over the chan-

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nel substantially as heremibefore described and represented in th remaining figures of the said drawings.

52,799.—Driving Apparatus of Metal or Wood into the Ground.—William W. Winter (assignor to himself and Stephen Brower), Cortlandville, N. Y.:

I claim a driving apparatus constructed in a manner that the weight or driver is supported and guided by the roll, a, or tube to be driven, and also the application of the pulley thereto, substantially as herein shown and described.

52,800.—Fastening for Paper Boxes.—George. F. Wright, Clinton, Mass., assignor to himself and William Orr. Jr.:

I claim the applicanon of metallic clasps upon the joints of the pasteboard in paper boxes, substantially as and for the purpose specified.

52,801.—Brick Machine.—Thomas Matthew Gisborne, Lymington, Eng.:

First, I claim arranging a series of kilns, burning on the principle of the New Castle kiln, side by side in such a manner that the front or combustion end of the one kiln is contiguous to and can communicate with the back or chimney end of the next kiln, while the chimney end of each kiln can furthermore communicate either with a chimney common to all, or with a separate chimney.

Second, Constructing a series of kilns burning on the principle of the New castle kiln, placed side by side and made to taper from the combustion end to the chimney end, the chimney end of one kiln being made capable of communicating either with the combustion end of the kiln or with a common or separate flue or chimney.

Third, Constructing a series of kilns, burning on the principle of the Newcastle kiln, made to taper from the combustion end to the chimney end, and arranged side by side alternately in reversed positions, the chimney end of the one kiln being made capable of communicat on either with the combustion end of the next kiln or with a common or separate flue or chimney.

52,802.—Machine for Making Boots and Shoes.—Charles Henry Southall, and Robert Heap, Staleybridge, Eng.:

First, We claim the brake, i, lever, f3, and lever, J, for instantly stopping the drum, e when the driving power is taken off.

Second, The improved vises for holding the boots and shoes so firmly that they can be operated upon with ease and certainty.

Third, The bearings or brackets, y, on the tables, for enabling the vises, and consequently the boots or shoes, to move up and down, according to the shapes of the bottom of soles.

Fourth, The system of employing under each a rack round at one end and straight at the sides, so as to be adapted to all sorts and sizes of boots and shoes.

Fifth, The cam or pattern plates for determining the aforesaid up and down movement with certainty.

Sixth, The employment of the long shaft, o', plates, n' and e', the casting, k', the long pedestal shaft, c', and the shaft, g', for enabling the table to move to and fro and up and down easily.

Seventh, The deep wheel, a2, or an ordinary wheel which rises up and down with the wheel, f', for maintaining the wheel, f', constantly in gear.

Eighth, the balance lever, g', for raising the table and its appendages when a catch is removed.

Ninth. The cam-shaped hammer, s', raised by the chain, z', and weight, y', for forcibly pressing the sole of the boot or shoe against the nose of the shears.

Tenth, The cam, v', on the shaft, k, the lever, u', and the chain, x, for taking off the weight of the hammer when the boot or shoe has to be moved for a fresh screw, and allowing the weight to be put on immediately the cam has passed the tail of the lever.

Eleventh, The system of making the holders, guards, and cutters, as shown in Figs, 12 13 and 14, for paring and shaping the soles and heels after they have been screwed on, and also the employment of similar holders for the finishing tools.

Twelfth, The movable arm or lever, l3, Fig. l, for carrying the holders with the paring and finishing tools, and also the levers, m3 nd n3, for enabling the tools to follow the surface and sides of sole nd heel.

Thirteenth, The cams, x3 and x4, Fig. l, for acting on the levers, v3, for giving, by means of the gearing and clutches, r3, alternate motion to the table, k3.

Fourteenth, The weight, g3, or its equivalent, connected directly or indirectly to the slide, p3, jointed to the movable arm, l3, for keeping the cutters and tools in their places as their guards ride on the surface of the sole or heel.

Fifteenth, The apparatus shown in Figs. 15 and 16, for holding the leather to be cut into sides, and also the application to a holder similar to those shown in Figs. 12 13 and 14 of a cutting knife, Fig. 17, for cutting the soles from the hide.

Sixteenth, The adaptation of our improvements either to one machine, as shown in the drawings, or to a machine employed only for cutting the soles, or to a machine for only screwing the soles and heels on to the uppers or coverings, or to one employed only for paring and finishing, as all such improvements are herein described and illustrated in the accompanying three sheets of drawings.

52,803.—Mode of Printing Photographs.—W. Bentley Woodbury, Manchester, Eng.:

I claim the use, in connection with the plates herein described, or with any engraved plate, of semi-transparent or partially transparent inks, substantially in the manner and for the purpose specified

52,804.—Machine for Cutting Files.—James C. Cooke, Middletown, Conn.:

I claim, First, The securing of the cutter stock, F, to the reciprocating head, E, in the manner shown, or in any equivalent way, so that said cutter stock may be turned and adjusted at any point within the scope of its movement, to give the cutter a proper oblique position with the file blank, and the cutter always have its cutting edge in a horizontal plane.

Second, Placing the reciprocating head, E, between inclined guides, a a, so that said head will work in an inclined direction when said head, thus arranged, is used in combination with a cutter stock, F, applied in the manner substantially as described.

Third, The securing of the file blank, L, to the bed, K, by means of the jaws, n n', arranged substantially as set forth.

Fourth, The raising and lowering of the bed, I, to compensate for the varying thickness of the file blank, L, by means substantially as described.

Fifth, The means employed for communicating from shaft, B, motion intermittingly, and in either direction to the shaft, Y, which turns the central screw, T, to wit the two ratchets. Z Z', pawls, A A', operated from the shaft, B, as shown and described, the sleeve or collar, F', on shaft, Y, with pinion, G', and the cam, H', and collar, P, upon it, the brake, J', and the segment, L', all arranged substantially as set forth.

Sixth, The bar, P', connected with the arm, M' having the tooth segment, L', attached when said parts are used in connection with a bar or feeler, Q*, connected with cutter stock, F, and all arranged to operate substantially as described.

Seventh, The bar or feeler, Q*, applied to the cutter stock, F, in the manner substantially as set forth.

52,805.—Horse Hay Fork.—B. F. Hisert, Norton Hill, N. Y.:

First. I claim the bar, A, provided with the pivoted tine, H, in combination with the slide, C, connected to the tine by a rod, I, the catch, D attached to the spring, E, and the bar, c, in the slide, C, all arranged to operate substantially as and for the purpose set forth.

Second, The bar, A, with i spivoted tine, H, in combination with the rod, I, pivoted to the tine, 11, near its center of motion, the locking bar, c, and spring catch for the purpose described.

Third, The combination of the catch, D, the tripping lever, F, and the sliding locking bar, c, with the bar, A, and pivoted tine, H, substantially as and for the purpose described.

Fourth, The combination and arrangement of the catch, D, tripping lever, F, bar, A, loop, f, and cord, G, as and for the purpose described.

2,806.—Guard Plate for Boilers.—Andrew O'Neill, Portsmouth, Ohio.:

First, I claim a cast-metal guard plate or shield for attachment to the bottoms of boilers, either with or without the openings, feet or marginal flange, substantially as described and represented.

Second, the cast-metal guard plate in combination, with the feet, for the purpose described.

Third, In combination with the cast-metal guard plate, I further aim the rim or marginal elevation, B, embracing the shoulder of e pit or drop of a sheet-metal boiling vessel.

Fourth, In combination with the guard plate I claim the slot, E, r the passage of the rivets in case of the unequal expansion of the ssel and plate.

2,807.—Plow.—Thomas J. Cornell, Decatur, Ill.:

First, I claim the plate or cover, G, placed between the upper edges of the land side and mold board when used in connection with the wheel, E, for the purpose specified.

Second, The wheel, I, constructed and arranged substantially as shown. Journaled on a horizontal axis set obliquely to the line of draught, and rotated by contact with the furrow slice.

52,808.—Operating Horse Hay Forks.—Henry Maycock, Verona, N. Y.:

I claim the arrrngement of the guard rope, D, weight, F, pulley, E, and whiffletree, D, constructed and operating in the manner and for the purpose herein specified.

In combination with the above, I claim the arrangement of the guide rope, G, ring, d, and rope, C, constructed and operating in the man er and for the purpose herein specified.

REISSUES.

2,176.—Eyelet for Lacing Shoes.—Charles Goodyear, Jr., New York City, assignor of Jacob Autenrieth, Philadelphia, Pa. Patented Jan. 6, 1863:

First, I claim as shoe lacing with its eyelets and cords, constructed and arranged substantially as described.

Second, The metallic lacing, eyelet or loop constructed and arranged substantially as herein described, so that the lacing cord shall run through the same without traversing the leather or material of the shoe or other article of wearing apparel to be laced.

Third, The arrangement of the metallic eyelet or loop transversely in relation to the fastening device, as herein described, so that the said eyelets or loops, when fastened on to the leather or material shall be situate in vertical planes relatively to the surface of the leather or material, as set forth.

2,177.—Apparatus for Drawing Soda Water.—William Gee, New York City. Patented May 19, 1863. Reissued Feb. 2, 1864:

First, I claim the valve, D, and its parts, e G H H', and passage or aperture, g, in combination with the valve, B, and its parts, c E F F', and passage or aperture, h, forming a cock, for the purpose set forth.

Second, I claim the means of drawing soda or mineral water from a small and a large outlet passage or aperture having one connection with a draft tube of a soda-water apparatus, substantially as and for the purpose herein specified.

Third, I claim the small passage or aperture, a, for the purpose of compressing the soda water while being admitted into the large passage or outlet ape ture, g, for the purpose set forth.

Fourth, I claim drawing soda water in a large stream passing first through a smaller passage into a larger passage or space from which proceeds the larger stream.

Fifth, I claim drawing soda or mineral water in a large and small stream from one nozzle or opening in connection with a fountain or other apparatus, substantially as herein described.

2,178.—Distributing Grain to Different Bins.—Charles S. Hamilton, Fond du Lac, Wis. Patented June 21, 1864:

First, I claim the combination, with a revolving spout for delivering grain or similar material to different bins, of the shaft, M, or any equivalent device, to enable the attendant to move or adjust said spout, substantially as and for the purpose set forth.

Second, I claim the combination with a revolving spout, of an indicator, arranged to show the position of said spout, and to enable the attendant to properly adjust the same, substantially as and for the purposes set forth.

2,179.—Manufacture of White Rubber.—F. Marquard, Rahway, N. J. Patented Dec. 5, 1865:

First, I claim the method or process of treating india-rubber gutta-percha, or other similar gums, with hot water, for the purpose of washing them, after they have been previously bleached with chlorine gas, substantially as herein before set forth.

Second, I also claim the method or process of treating india-rubber, gutta-percha, or other similar gums, by distillation, after the gum has been bleached with chlorine gas, for the purpose hereinbefore set forth.

Third, I also claim the method or process of treating india-rubber, gutta-percha or other similar gums, that has been previously bleached with chlorine gas, and washed and distilled as hereinbefore set forth by redissolving it in chloroform or other solvent, and mixing with it phosphate of lime, and subjecting the compound to pressure in hot molds to harden and solidity it for the purposes described.

2,180.—Manufacture of White Rubber.—F. Marquard, Rahway, N. J. Patented Dec. 5, 1865:

First, I claim the method or process of treating india-rubber, or other similar gums when dissolved in chloroform or other solvent with caustic ammonia gas, chloride of ammonia for the purposes substantially as hereinbefore set forth.

Second, I also claim the method or process of washing the dissolved and bleached gum as hereinbefore set forth with hot water, for the purpose described.

Third, I also claim the method or process of distilling the dissolved and bleached gum, while in the washing process, or by a subsequent process, for the purposes hereinbefore set forth.

Fourth, I also claim the method or process of re-dissolving the water or gum obtained by the foregoing operations, and combining the same phosphare of lime or a carbonate of zinc, by means of pressure in hot molds to harden the compound for the purpose set forth.

DESIGNS.

2,265.—Coffin.—Thomas Devins, Cambridgeport, Mass.:

Notes and Queries

S. C. D., of Tenn.—The object glasses of the best compound microscopes are usually made by the combination of three lenses; the distance from the object glass to the eye piece is 10½ inches, that being the distance of most distinct vision. The reflecting mirror is generally made plane on one side and concave on the other. Carpenter on the Microscope is a standard work. For a practical treatise on optics write to Henry Carey Baird, of Philadelphia, or to John Wiley, of this city. Compound microscopes range in price from $15 to $600. You can get a very good one for $20 or $30.

H. B., of Wis.—Your plan of suspending a rod of iron without material support in a coil of wire through which a current of electricity is passing, and then giving the rod a rotary motion would not be called "perpetual motion," as there would be an expenditure of power in the battery. Professor Page made an engine several years ago in which an iron rod was alternately drawn in and out of a hollow helix by changing the poles of the battery. This engine would drive machinery, but as the power was obtained by consumption of zinc, it was more costly than steam power.

R. C. B., of Mich.—That the ascent of liquids in capillary tubes is due to atmospheric pressure has been suggested; but the fact that the liquids will rise vertically more than 34 feet is fatal to this theory.

A. H., of Pa.—No substance will dissolve lampblack.

B. Q., of Mass.—"The ingredients which supply the motive power of Ericsson's caloric engine" is hot air, and it is adapted to doing any kind of light work where one or two horse-power is needed.

W. B. G., of N. Y.—If you will read W. J. Macquorne Rankine's treatise on shipbuilding you will get a different idea of the attainments of the builders.

H. S. W., of Conn.—You can take steam from your heater in the manner proposed, but the heat you derive from it will be in proportion to the pressure in the heater; as your engine cuts off short, it will probably not be very great. Why do you dry your wet substance over the top of your boiler, not in contact with it? There is heat enough radiated from most boilers to do a great deal of work.

A. S.—If an inventor applies for a patent, and the Patent Office erroneously rejects the case and for many years maintains its refusal, but finally corrects its error and grants a patent, we know of no reason why the patent is not valid. The fact that the thing has come into general public use during these years of delay does not prejudice the rights of the inventor.

H. B. S.—There is no more pressure in the steam drum of your boilers than in the boilers themselves; there is less, it anything.

R. O., of Ohio,—We cannot give you the information you desire about the latest method of getting ice out of the water into the house.

W. V. V., of N. Y.—You will see by the files of the SCIENTIFIC AMERICAN that your question has been asked several times, without any satisfactory answer.

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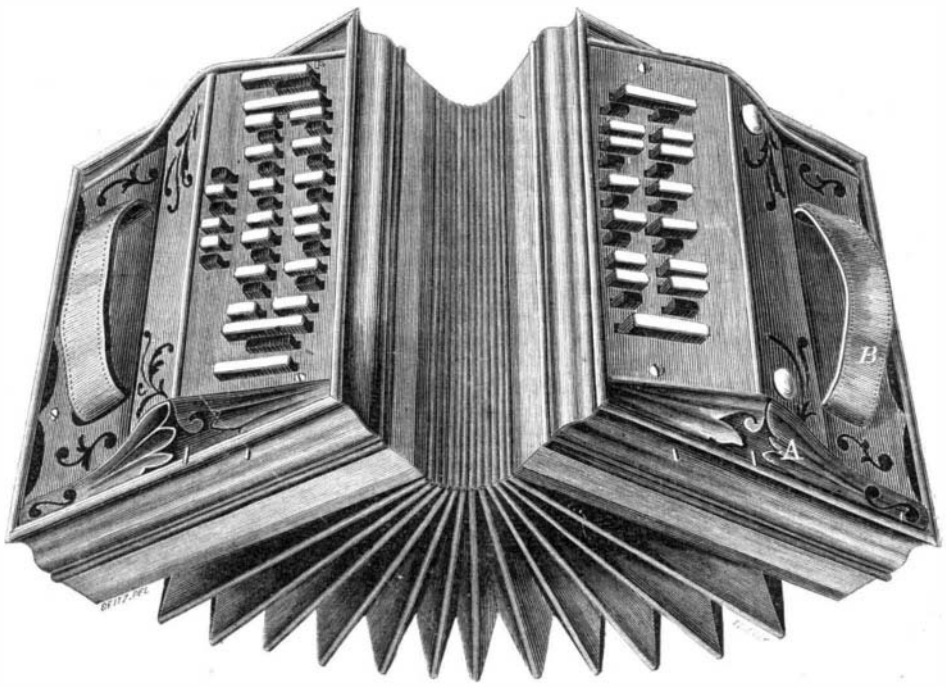
The peculiarity of this instrument over others of its class consists in the arrangement of the banks of keys. It will be seen that they form an angle with the side, A, so that the fingers, when the hand is passed through the band, B, are enabled to manipulate them with much greater nicety, ease, and delicacy than where the board is flat and the position of the fingers cramped and stiff. This constitutes its novel features. The most difficult music, arranged for piano or melodeon, can be executed on this instrument, says the inventor, and it is equally well adapted to accompany a singer, or lead an orchestra. One, two, or three notes can be produced at one pressure of the finger—as will be seen by referring to the engraving—giving clear and distinct tones, and adding to the power and attractiveness of the instrument.

Patented through the Scientific American Patent Agency on June 21, 1864. For further information address Ernest Pries, corner Fifty-eighth street and Second avenue, New York.



PRIES'S ORCHESTRON.

An Armor-clad Turret Ship at Sea.

We gave a full account some time ago of the trial of a small armor-clad seagoing turret ship, called the *Huascar*, built and fitted with machinery by Messrs. Laird Brothers, of Birkenhead. We have since obtained some particulars of her passage from this port to Brest. She is a vessel of 1,100 tuns, and 300 horse power, nominal, and obtained a speed of 12½ knots at the measured mile, the indicated horse-power on that occasion being 1,650. This vessel, after being completed for sea, left here for Holyhead on the 17th inst., encountered very severe weather on the passage, but proved herself an excellent sea boat, very buoyant, and rolled easily, even when placed broadside to a heavy sea in the race off Holyhead. She left Holyhead for Brest on the 20th inst., experiencing severe southwest gales in the Channel, but fully maintained her character as a good sea-going ship, and arrived off Ushant on the 22d inst., and anchored safely at Brest on the following morning. The *Huascar* had her guns on board, viz., two 300-pounders, mounted in the revolving turret, and two 40-pounders (broadside guns), equivalent to a broadside of 680 lbs. She had also her full complement of shot and shell, and stores and provisions for some months on board, in addition to about 100 tuns more coal than she is intended to carry for ordinary service. The trial, therefore, of the *Huascar* during the late severe weather we have had in the Channel, and when loaded unusually deep, is most satisfactory, and proves that armor-clad ships of even small size can be built on Captain Cowper Coles's turret principle to combine speed and sea-going qualities of the first order, carrying at the same time a much heavier and more effective armament than vessels of similar tunnage of any other construction.—*Liverpool Albion.*

Meerschaum Pipes.

A correspondent, who is a manufacturer of meerschaum pipes, gives us the following information relative to these goods:—

Meerschaum (English—foam of the sea), is so called on account of its remarkable lightness and pure white color in the raw state. It is a superior species of white clay, chiefly consisting of silicate of magnesia, and is dug mostly in the peninsula of Natoli, Asia Minor. It is sent to market in irregular blocks of different sizes, the latter fixing the price, which is much higher in proportion for large lumps than for small ones. The Turkish government owns the mines and stipulates the quotations according to the demand, which generally exceeds the supply. The last reports from Constantinople, the principal market for crude meerschaum, say that prices advanced 35 per cent lately.

The method of manufacturing pipes is very simple: the lumps are cut into shape with a knife, after having been lightly wetted, then the bowls must be very carefully rubbed to obtain a clear, smooth surface, and afterward boiled either in pure wax, or wax, oil and fats, the latter effecting a yellow hue and, facilitating the coloring.

Imitation meerschaum is invariably made of the parings of the genuine, and nothing else. Numerous other experiments, such as the application of magnesia, etc., have proved total failures, and, consequently, there is no probability of meerschaum being manufactured on a large scale of magnesia in New York, as your article states. I am the only manufacturer, to some extent, of meerschaum pipes, made of the imported raw material in the United States.

Quant's Hoop Lock.

This is an ingenious little device for fastening the ends of iron hoops used for binding bales or packages of any kind. It is remarkably simple and quickly attached. No holes are needed to secure the ends, and the object is attained in the simplest manner. A casting, A, has a narrow slot through it, and a square mortise, B, at right angles with the slot.

Fig 1

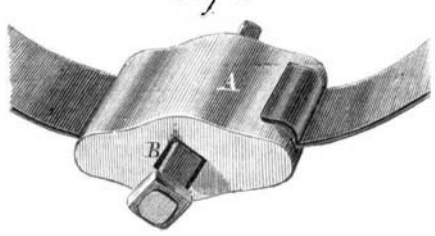
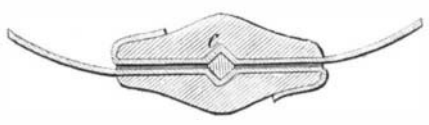


Fig. 2



These are the details: When used, the ends of the hoop are passed through the slot and turned over, as shown in Fig. 1; a common awl is inserted in the square hole and the parts opened; a cut nail is then driven in the square mortise, which upsets the hoop, as shown at C, in Fig. 2. This latter act not only binds the hoops firmly together, but also takes up the slack, so that the bale is bound as tight as can be. All the parts can be cheaply made, and require no delicate handling or adjustment. A saving in time also results from the employment of it, as many more packages can be secured than by the former methods. Short pieces of iron, not available for other purposes, may be used with the lock, as it is sold so cheaply.

It was patented Nov. 28, 1865, by Frank Quant; for further information address him at Painesville, Ohio.

Stuffing Box.

Mr. T. H. Thompson, manager of the Durham Gold-Mining Co., Ballarat, Australia, has invented an improved stuffing box for the plungers of mining pumps. The invention consists of a large horizontal cog-wheel on the upper surface of the gland of the stuffing box. In this cog-wheel the nuts belonging to the bolts that hold the flanges of the box together are made to fit like spur wheels, the nuts being toothed. It will readily be seen that on turning one of these nuts to tighten and loosen the bolt, the larger wheel will also travel round, giving motion to all the other nuts at the same time. By having a vertical key, similar to those in use by fire plugs in streets, a single nut may in this way readily be reached below the water at times when the getting at all of them would be almost an impossibilty. A winch is also provided in a convenient position for raising the gland when repacking. We understand that several practical engineers have expressed warm approval of the Thompson stuffing box.—*Dickers's Mining Journal* (*Melbourne*).

[It is singular to see how inventions repeat themselves. The device mentioned above has been used for years on steam engines.—Eds.

MECHANICS

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